

# STEEL

The Magazine of Metalworking and Metalproducing

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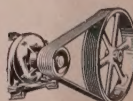
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**B.F. Goodrich**  
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# Behind the Scenes...

## Now, Tool Steels

Carrying along in our current major series on fundamentals of steel-making, our editors present March 7 the first installment in a new article on production of tool steels. Incidentally, a limited supply of tear sheets of this, as well as preceding articles in the series is available. If you missed part, or don't want to destroy your copies, we'll be glad to fill in the gaps for you. Which reminds us that we now have a stock of reprints of Joe Sullivan's flow sheet of the steel industry for 1948, which also are yours for the asking.

## Fifty Years Ago

Fifty years ago this week found iron and steel markets in a state of excitement, with prices on nearly all items suddenly skyrocketing and many large deals being closed. A full fledged boom was under way, with many buyers unable to cover their needs. And, in an article on foundry practice, we find the following gems: "The cost of melting iron in a cupola is about two dollars per ton. Less fuel is generally required to melt iron in a foundry office than to melt it in a cupola." Among the products advertised are horse shoes, steam engines and meals, the latter for 50c each, regardless of menu.

## Same Faces, New Places

At this point we want to take note of a couple of changes in the column to our immediate right. Cal Fisher and Bill Poland, who until this month had been members of our circulation staff, have moved up to positions on the advertising staff, in New England and Ohio respectively. Some of you will no doubt be hearing from them soon, if you're in either of those areas.

## Lots of 205 Readers

After a good deal of mechanical delay and considerable laziness on our part, the certificates have been mailed to all you 205th readers. All, that is, but one. His name is Cy G. Harwin, and he sent us a postcard which said that we didn't (and don't) know him from Adam. He was extremely right about that, but to make things more difficult, he didn't tell us his address. And, to top it all off—and this is the first time we've ever seen it happen—the post card he sent us came through the Yew-nited States Mails without a trace of a postmark or cancellation of any

kind. If you're listening, Mr. Harwin, suh, let us know where you are and we'll be glad to send you a certificate. And we have some extra ones available, too, which Cmfwyp has whipped up in his spare time, so if any other of you readers would like either protection or evidence, drop us a note and we'll give you a small piece of paper proving that you, and you alone are the 205th member of our reader army.

## Belt Line Gossip

By now you have all learned about that conveyor belt idea which was unveiled here in Cleveland a week ago last Wednesday. It is one of the most intriguing ideas we've read about in a long time, but one of the more interesting side lights on it was that the original idea came from the wife of one of the men behind it! And now we're wondering how long it will be before somebody comes up with an idea for hauling a lot of other stuff via intercity conveyor, a la Buck Rogers!

## Puzzle Corner

The clock puzzle of two weeks ago probably proved very easy for you if you remembered to use the  $D=12d$  formula for the speed of the two hands. The two hands coincide at 5:27 2/11; they form a right angle at 5:10 10/11; they are 30 degrees apart at 5:21 9/11; and 16 4/11 minutes later, at 5:38 2/11 they are 60 degrees apart. This week we are going to print one which just came in, sans answer. Usually we won't do these things, because there might just be no answer at all, but this one is so intriguing that we couldn't resist. It comes from R. B. Bagby, of Bagby & Co., Evanston, Ill., and he says that Nick Archimedes Omega fashioned a pattern and ordered a nickel iron casting, which was to be 45% nickel and 55% iron. When the casting was delivered, Nick weighed it while it was suspended in water and found the figure to be 22 lbs. He then weighed it on the scales and took it right back to the foundry, complaining that it was a 25-75 casting. How much did the casting weigh? Try that one on your foundry superintendent, while we rush off to test the knowledge of the editors of the *Foundry*, which also sees the light of day in this print shop.

*Shradu*

(Editorial Index—page 57)

# STEEL

Vol. 124—No. 8

February 21, 1949

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Editorial Staff on Contents Page





# Engineering News

## ON ABRASIVE PRODUCTS

### Greater Efficiency from New Coated Abrasives

A much higher degree of efficiency is being realized in dry grinding operations on metals. It is credited to the development of a new Resin Industrial Cloth specially designed for use on backstand idlers. This product is particularly effective on operations involving heavy stock removal, sharp contours, high belt speeds, heat sensitive metals, excessive frictional heat, humidity and other complications.

Strength, heat-resistance and backing characteristics provide longer productive life where severe strains are imposed. A remarkable freedom from gumming and loading, together with resistance to grain shedding, produce fine finishes, results in infrequent belt changes. This means stepped up production... longer runs.

To attain the greatest productivity at low cost from Resin Industrial Cloth, attention must be closely centered on its correct selection and utilization. Our field men are fully informed and experienced. It is only logical to ask their advice on your particular application. They will be glad to cooperate.



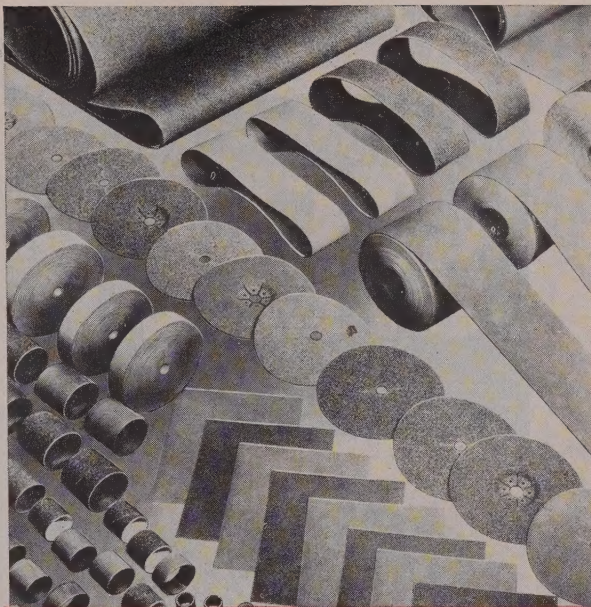
### New Development in High Speed Snagging Wheels

B-5 and B-7N are a recent development in ALOXITE aluminum oxide resinoid bond wheels that represent a major advance in high speed snagging. Actual operating experience in foundry, mill, forge and welding shop operations confirms a long list of advantages. A cutting rate as high as 9500 surface feet per minute is maintained continuously throughout the extended life of these wheels; primarily because the tendency to load is much less than with previous wheels of this type. A maximum degree of safety is provided the operator under severe conditions. Speed tests to destruction reveal a much higher mechanical strength while field tests show greatly improved resistance to heat and mechanical shock.



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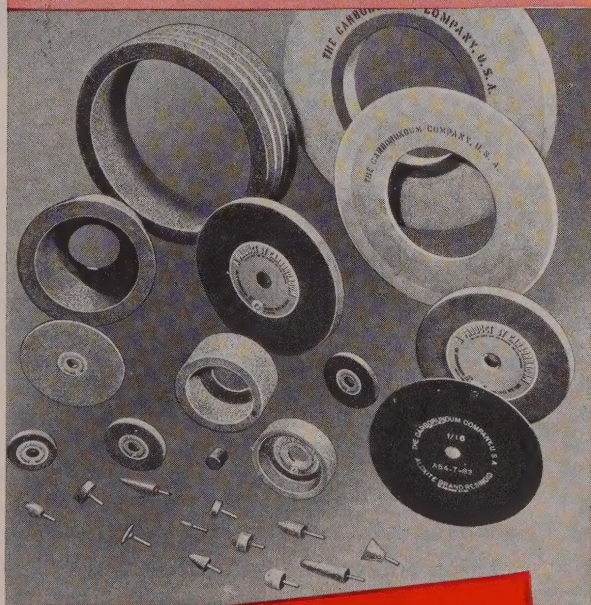


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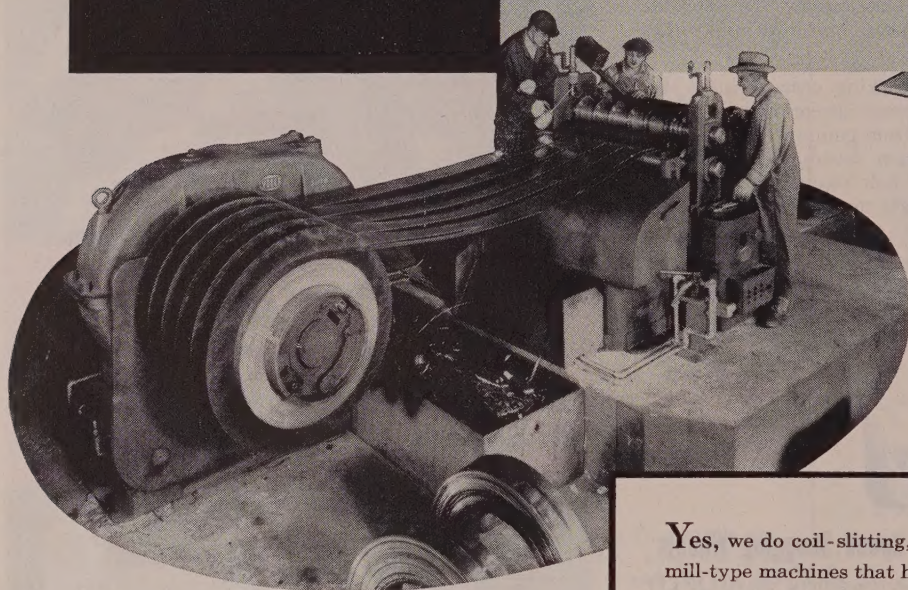
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in Tank Fabrication  
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Replacement Parts Shipments  
Special Indexing Fixture  
Doubles Broaching Rate  
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# STEEL

The Magazine of Metalworking and Metalproducing

VOL. 124, NO. 8

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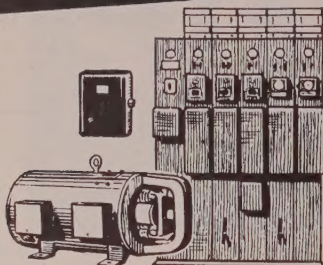
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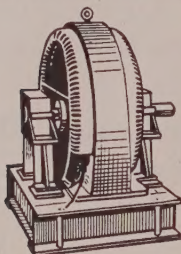
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### STANDBY BATTERY-CHARGERS

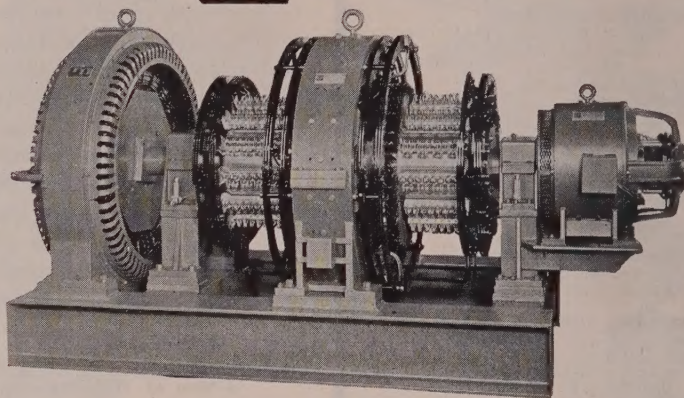
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## AS THE EDITOR VIEWS THE NEWS

February 21, 1949

### For High Stakes

American industry is woefully apathetic to the importance of the battle that is being waged in Washington on behalf of a fair labor bill by a small band of right-minded senators and representatives against the powerful forces of the administration and labor union bosses. Observers on the scene are appalled at the meager support the leaders of the militant minority are receiving from their employer and public-minded constituents.

Every industrialist should know by this time that the effort to scuttle the Taft-Hartley Act and to return to the Wagner Act is a gamble for high stakes. If union chiefs can put over their program, then reckless unionism will ride high, wide and handsome over the rights of employees, employers and the public for years to come. Should they succeed, labor leaders will wield more power than the representatives of any other group.

Senator Taft and a small body of stalwarts are fully aware of this danger. They are risking political suicide to preserve a balanced labor law that will protect the employer and the public as well as the unionized employee. Against overwhelming odds, already they have made the position of President Truman and the testimony of Secretary of Labor Tobin and Attorney General Clark look silly. They have forced the administration forces to extend the period of hearings. They have won the jump on the opposition.

This advantage cannot be held long unless assistance comes from employers and the public who want a fair, two-sided labor law. Committee votes in the House, which could be tremendously important, hang on such slender threads as whether or not a representative happens to be in a hospital when the vote is taken or whether or not the youngest member of congress changes his mind.

The situation is critical but it is not hopeless. Make a canvass of opinion in your own locality. You will find ample support among the public and even among some substantial labor union personnel to justify you to make a strong appeal to your senators and congressmen to stand firm for a just labor law. Make that appeal promptly and with all the force you can muster!

\* \* \*

**PRODUCERS CRITICIZED:** A report on "Problems of Steel Distribution," submitted by the Steel Subcommittee to the Special Committee To Study Problems of American Small Business, deserves careful attention by everybody concerned with the production, distribution and consumption of finished steel.

It deals with four major complaints on the part of steel consumers, namely that (1) producers favor their own fabricating subsidiaries at the expense of independent consumers; (2) producers favor their own warehouse affiliates

at the expense of independent warehouses; (3) producers force consumers to accept cold-rolled material when they would prefer to have hot-rolled; and (4) producers are abandoning consumers in localities distant from mills or former basing points.

The report cites testimony of consumers and producers on all four charges and then states conclusions which are extremely critical of the major steel companies. Any reader of the complete report who is fairly well informed on what has been going on in recent years probably will

(OVER)



# AS THE EDITOR VIEWS THE NEWS

agree that the evidence, while detailed, is not conclusive enough to warrant the generalization that all small consumers were treated shabbily or that all large producers were uniformly guilty of discrimination.

However, the very fact that so much evidence critical of the steel industry has been offered publicly should be a warning to producers that they are in a vulnerable position. They have two alternatives: If their distribution generally actually has been fairer than indicated in the subcommittee's report, prove it. If mistakes have been made in what admittedly is an extremely difficult job, correct them. —p. 70

\* \* \*

**BUILDERS NEED ORDERS:** As time goes on, industry probably will hear more and more about the Naval Industrial Reserve plant at Kansas City, Mo., which is to be operated under a 5-year lease by the Westinghouse Electric Corp. for the production of jet engines.

Plans for equipping this plant call for withdrawing some general purpose machine tools from the military reserve, but a considerable volume of new special-purpose tools, some of which are still in the drawing board stage, will be purchased. Some authorities believe that purchases for this jet engine plant may turn out to be the largest machine tool procurement program undertaken by the armed services since the war.

Something of this sort would be welcomed by machine tool builders, who find it difficult under present conditions to maintain their facilities up to the standards that are desirable from the standpoint of national security. —p. 65

\* \* \*

**SEE FEW 1949 STRIKES:** Representatives of management and labor attending the personnel conference of the American Management Association in Chicago last week were confident that 1949 will not witness a recurrence of strikes on the 1946 scale.

Labor spokesmen declared that today there is no issue of protecting take-home pay as was the case in 1946 and that today there is a freer atmosphere for collective bargaining, due to the absence of government interference. Spokesmen of management asserted that there is doubt whether rank-and-file workers would follow a strike order. Secondly, they believe union leaders would be more reluctant to deplete union treasuries through the payment of strike benefits.

Consensus of executives attending the con-

ference was that few companies will grant straight wage increases, that some will make moderate social insurance concessions and that pension plans will enter the discussion stage with action deferred until 1950. —p. 66

\* \* \*

**PONDER BELT PROJECT:** Last week a bill was introduced in the Ohio legislature to permit Riverlake Belt Conveyor Lines Inc. to exercise the right of eminent domain in acquiring right-of-way for its proposed 130-mile conveyor system connecting Lorain and East Liverpool, O., with spur lines to Youngstown and Cleveland.

Announcement of this novel project, which was described in last week's issue, has aroused much speculation in the area it would serve. Coal, iron and steel men acknowledge keen interest in its possible economies in transportation. Railroad men, Lake Erie port officials and others whose interests would be affected have been cautious in commenting upon the proposal. Numerous questions which the project poses—such as whether or not it will affect the proposed Lake Erie-Ohio river canal through Warren and Youngstown—remain unanswered.

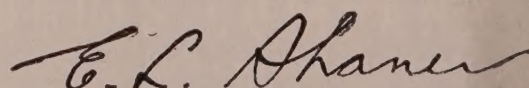
One thing is definite. The bold scheme has stimulated renewed interest in the use of belt conveyors for bulk material handling. —p. 66

\* \* \*

**TAPS WITH EXPLOSIVES:** Operating officials who attended the winter meeting of the Eastern States Blast Furnace & Coke Oven Association in Pittsburgh heard a progress report on the development of the jet caster, a new device for opening tapholes in blast furnaces, open hearths and other metallurgical furnaces.

The caster is a torpedo-shaped cylinder containing a cone-shaped explosive charge with suitable blasting cap. After the caster has been inserted in a hole drilled in the clay plug of the taphole, the cap is connected electrically with a blasting machine located at a proper distance. The explosive, when detonated, has a penetrating force of 5 million pounds per square inch, which is sufficient to blow a 2-inch hole through 8 inches of frozen metal.

Tests to date indicate the new technique brings a full flow of hot metal immediately, reduces casting time, provides uniform taps and minimizes the hazards of tapping. —p. 108



EDITOR-IN-CHIEF





Howard Allen, Inspector



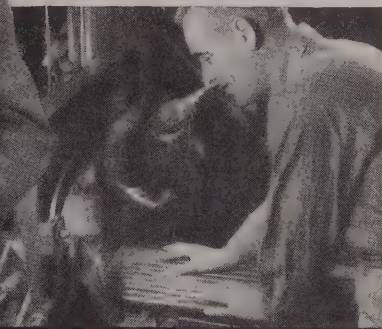
Howard Allen, Sales Representative



Howard Allen, Lab. Man



Howard Allen on Order Desk



Howard Allen, Machine Operator

## Outside Man with an Inside Story

Do you know the inside story behind your Ryerson sales representative? It's a story of years spent within a Ryerson plant. A story of the steel inspection department, the operating department, the service department and others—inside jobs through which a Ryerson salesman builds up the experience he applies—outside—to your steel problems.

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Joseph T. Ryerson & Son, Inc. Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco.

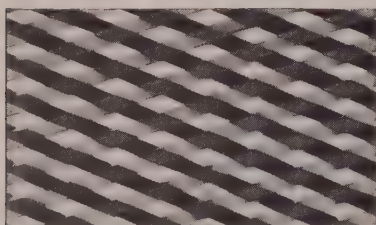
# RYERSON STEEL



# Paradise *for* Designers



NICKELOID PRE-PLATED METALS SHOWN IN GREAT ARRAY OF PATTERNS, FINISHES



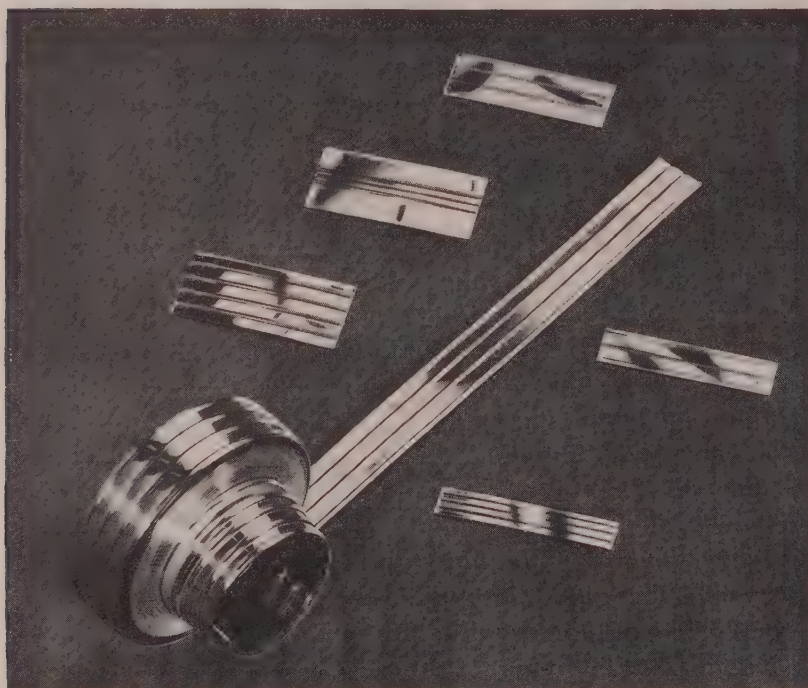
Nickeloid Metals Diamond Crimp



Nickeloid Metals Horizontal Crimp



Nickeloid Metals Diagonal Crimp



The new embossed design shown here in several interesting variations. Design can be embossed (raised) or intaglio (depressed).

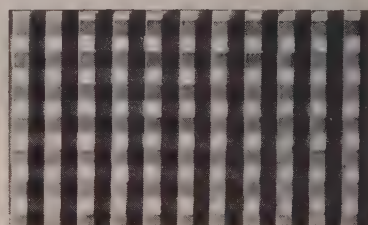
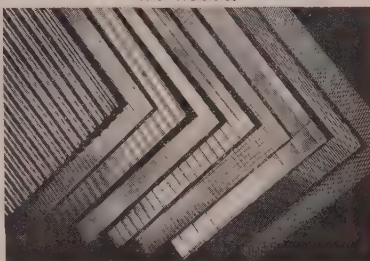
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Nickeloid Metals are furnished in durable pre-plated finishes of Chromium, Nickel, Brass or Copper in sheets and coils — base metals of steel, zinc, brass, copper, or aluminum. The base metal can be chosen from the standpoint of one or more of the following factors: cost, resistance to heat, rust-resistance, availability, workability.



**STEEL DISTRIBUTION**—Withdrawals by major steel producers from certain areas and increased integration by the industry have left many small consumers without sources of steel supply. This is the gist of the Martin committee survey of postwar changes in steel distribution (p. 70), based on comprehensive studies of 14 large producers. The committee found that a somewhat larger percentage of steel products are going to fabricating subsidiaries of the producers and that subsidiary warehouses have been obtaining a larger share of output.

**MACHINE TOOLS**—How to maintain a strong machine tool industry, with capacity and manpower adequate for meeting any possible emergency, is a major problem for military planning officials in Washington (p. 65). Present sales volume, while pretty good compared with prewar volume, is inadequate to maintain the expanded plant created during the war. More liberal purchasing policies to sustain tool builders and help them hold their skilled workers are being considered.

**1949 LABOR DEMANDS**—Pensions and social insurance will overshadow straight wage increases when management and the unions sit down to discuss fourth round demands (p. 66). Metalworking executives are advised to prepare themselves with factual and actuarial data on these social security items before entering the bargaining sessions, lest they be lured into agreeing to long-term programs that later may prove difficult or impossible to maintain.

**STEEL EARNINGS**—Expanded capacity, peak operations and upward adjustment in prices are reflected in the substantial improvement in steel earnings during 1948 (p. 68). Fourteen major producers report aggregate income last year was \$445 million, against \$335 million in 1947.

**EXPANSION STYMIED**—Confusion over pricing policies has caused many New York state companies to shelve plans for expansion until the situation is clarified (p. 69), a survey of the state's manufacturing concerns reveals. Some manufacturers said they would be penalized in the purchase of steel and other materials under an f.o.b. pricing policy, while others reported they would lose customers in distant markets.

**MARSHALL PLAN APPROVED**—Satisfaction with the operation of the Marshall Plan in advancing western Europe's economic recovery is expressed in two reports issued by the National Planning Association (p. 72). Full cure of Europe's economic problems, however, is seen as lying beyond the Marshall Plan.

**FOREIGN TRADE STRESSED**—Europe's concentration on foreign trade is showing concrete results, both in exports and imports (p. 75). Makers of capital goods in Germany have large backlogs of orders for export. France has purchased heavy coal hoists made in this country, originally for Russian account. Britain established a record in iron and steel exports last year and is driving toward new marks in auto exports. However, foreign trade continues to be hampered by import controls imposed by many countries (p. 76).

**HERE AND THERE IN INDUSTRY**—National Federation of Small Business has asked the House Ways & Means Committee to consider tax relief for small companies (p. 72) . . . Expansion of this country's steelmaking capacity is raising critical problems of raw material supply (p. 77) . . . Final figures on 1949 auto production show actual output topped estimates, with 5,549,323 cars and trucks produced in this country and Canada (p. 79) . . . E. W. Bliss Co. has established a replacement parts program to provide large inventories and quick deliveries (p. 82) . . . Wholesale prices continue to slide downward and the government index now is 13 points below the level of last August (p. 84) . . . Lebanon Steel Foundry has expanded its casting facilities to provide for production of super-alloy parts for jet engines (p. 82).



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Characteristics

Soaking Pits

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Plates, Bars, Shapes

Steel Rails

Continuous Sheet  
and Strip Mills

Pack Mills

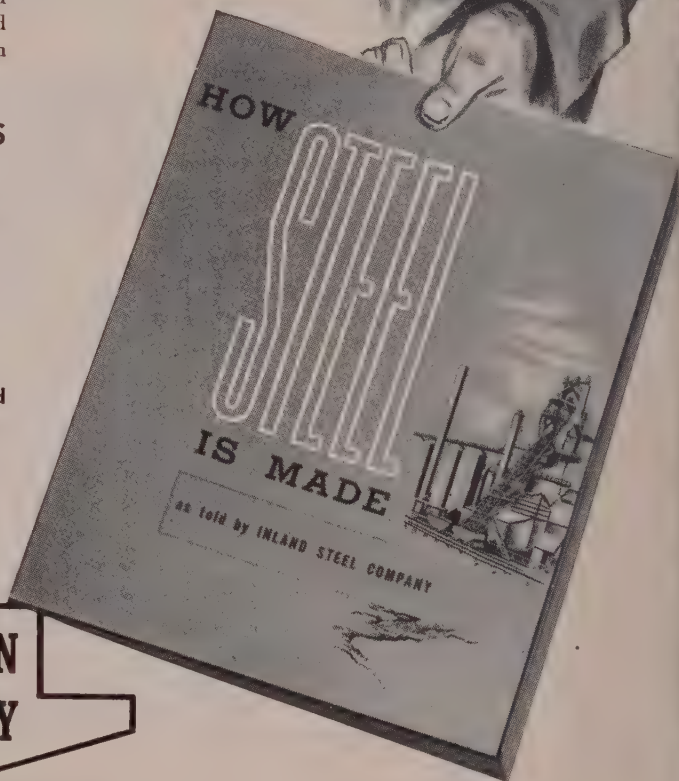
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STEEL



# Tool Sales Lag Alarms Military

**Need for more liberal defense purchasing policy seen to sustain toolbuilders in strong position. Industry's loss of skilled mechanics cause for concern**

WHAT CAN be done to help the machine tool industry maintain its strength so as to be ready to meet any demands upon it in event of another war?

That's a question worrying the military brass hats in Washington these days with reports coming to them the industry's sales volume is too low to maintain its strong position and it is losing skilled mechanics because some tool builders cannot provide full-time employment. Considering the delicate state of international relations today, procurement officials feel it would be a serious mistake if skilled labor forces were allowed to melt away in this industry.

**Shrinking Sales** — The problem stems from shrinking tool sales. While substantial business continues to be done compared with prewar, tool sales are far under wartime levels, and, of course, are insufficient to keep expanded plant facilities and labor forces fully engaged.

In this connection it is pointed out although machine tools constitute the backbone of mass production, significantly, only during peak war-

time production does the tool industry itself assume the characteristics of a mass production industry.

This is reflected in the accompanying chart which portrays conditions in 1942 and 1943 when the bars showing dollar volume of shipments topped the bars on industry manpower as compared with 1939-41 and 1944-48. During 1942 and 1943, the critical years in war tooling, machine tool designs were "frozen," manufacture of special machines discouraged, and extraordinary measures taken to tool up and "conveyorize" the machine tool shops for line production of standard models in maximum quantities.

**Not Feasible**—Such measures are not economically feasible in the more normal times now prevailing—particularly when even standard models have many special features and assembly is slowed down by innovations such as electronic, hydraulic and involved mechanical control and actuating systems demanding the attention of highly trained specialists on the erecting and testing floors.

Military procurement officers haven't the answer to the problem

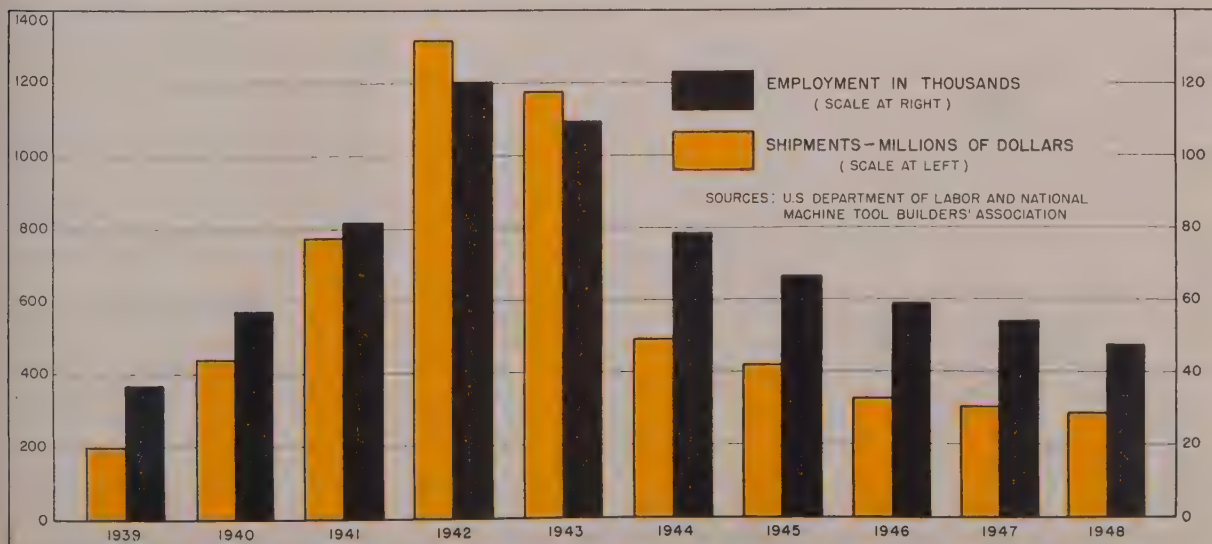
posed in this industry but they are working at it and hope to come up with something constructive, soon. Right now they are adopting a firm policy on the military tool reserve, withdrawals from this reserve to be on a more selective basis.

**Buying New Tools**—An example of how present reasoning in military procurement circles works is the arrangement for equipping the Naval Industrial Reserve Plant at Kansas City, Mo., to be operated under a 5-year lease by the Westinghouse Electric Corp. for production of jet engines. To equip this plant, some general purpose tools are being withdrawn from the reserve but a lot of special-purpose tools, some of the latter only on the drawing boards as yet, are to be bought. Purchases for this plant will be substantial; in fact it is expected the total will by all odds be the biggest machine tool procurement by the armed services since the war.

The decision to buy these new tools was arrived at on two counts: 1. To keep the reserve intact, unwarranted withdrawals not to be made; 2. new tools of latest design are necessary to machine hitherto "unmachinable" materials and otherwise to put jet engine production on an efficient basis at Kansas City.

**Trade-Ins Suggested**—Another answer aimed at helping the machine tool industry during its present doldrums is to explore the possibilities of trading World War II model machines in the reserve for tools of

**ANNUAL SHIPMENTS AND EMPLOYMENT IN THE MACHINE TOOL INDUSTRY**





latest design. Military authorities lack funds to replace machine tools in the reserve and they fear unless trade-in arrangements can be worked out they soon will find themselves with a lot of obsolete machinery on their hands. The simplest approach, of course, would be to buy a certain number of new model tools each year for the reserve, but to date the armed services haven't been able to get their requests for such appropriations past the Bureau of the Budget.

Machine tool builders at the moment are encouraged by the fact surplus government-owned machines have been pretty well sold off.

## Plan for Belt Conveyor Pushed

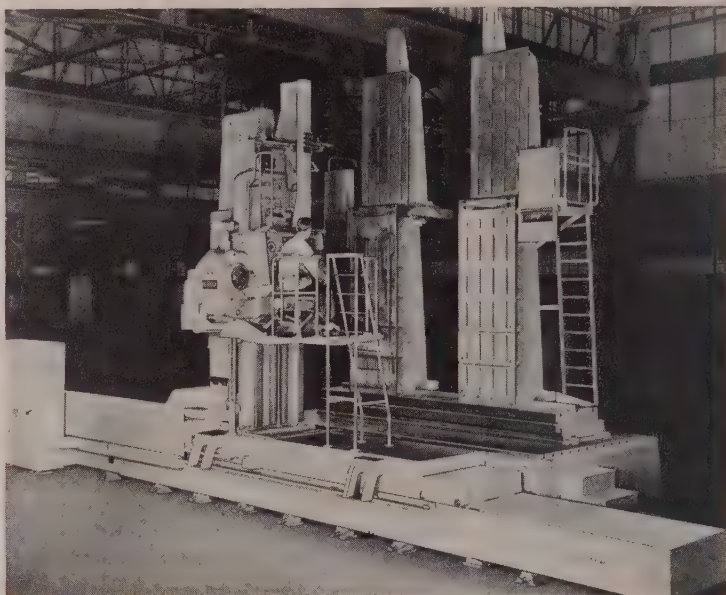
MOVE to clear the way for a 130-mile bulk materials belt conveyor line in northeastern Ohio was made last week with introduction in the Ohio legislature of a bill to permit the project's sponsors to exercise the right of eminent domain in acquiring right-of-way.

Introduction came less than a week after announcement of the proposed project by the newly formed Riverlake Belt Conveyor Lines Inc., headed by H. B. Stewart Jr., Akron, president, Akron, Canton & Youngstown Railroad.

Reactions to the proposed project are mixed. Envisioning considerable freight savings on iron ore, coal and limestone that would move over the "rubber railroad," steel industry representatives have responded warmly to the proposal. Also enthusiastic are communities that would be terminals on the \$210 million system. Among others interested were some coal field operators who foresee a widening of markets for them.

Opposition comes from some members of the railroad fraternity, although high officials of railroads decline to comment until they have thoroughly studied the proposed project. However, A. F. Whitney, Cleveland, head of the Brotherhood of Railroad Trainmen, displayed outright hostility.

Meanwhile, there is speculation in various lake ports as to whether they will benefit or lose from installation of the "aerial railroad." Likewise all other localities and groups that would be affected are studying the economic changes that might come about from the conveyor project. Regardless of their attitude toward the project, most people are agreed on one point—that the conveyor belt line, although gigantic, is feasible, for on smaller scale such systems have been used for a number of years.



**LARGER KELLER:** New manufacturing possibilities for long, smooth streamlined shapes in pressed metal are opened to automobile builders by this huge Keller die cutting machine just completed by Pratt & Whitney, West Hartford, Conn. Capable of sinking dies and cutting mating punches up to 7 x 14 feet, this machine is controlled through an electromagnetic "touch" system. Sensitive tracer finger, shown at top of column, transmits its movements over surface of wood or plaster master form to cutter spindle in work head at left of operator. Thus exact shape of master form is reproduced automatically in metal die block

## Pensions, Insurance Big 1949 Issues

**Management advised to forearm itself with factual and actuarial data on retirement income and social insurance plans in preparation for collective bargaining sessions**

PENSIONS and social insurance will take precedence over straight wage increases in many of this year's collective bargaining sessions between industry and labor.

While softening of the general economy and declines in the cost of living have weakened labor's straight wage demands, union leaders will push for pensions and insurance while manpower is still relatively tight and the reports for 1948 show large corporate profits.

Management would be well advised to prepare itself with sound factual and actuarial data on retirement and insurance plans in advance of the presentation of demands for such programs by the unions.

These were some of the highlights expressed at the American Management Association's personnel conference at the Palmer House, Chicago, Feb. 14-16.

**Pensions Take Time—Formulation**

of a pension plan is necessarily a complex and time consuming task which should be approached with great care, warned Herbert L. Jamison, New York insurance and pension counselor.

"Pensions involve a long-range program with complicated actuarial and legal angles and very heavy expenditures. In these respects it cannot be changed or modified every year or so as readily as group life or other forms of annual renewable group insurance."

Many of the management representatives at the conference doubted that pensions should be made a subject of collective bargaining. Despite the ruling by the National Labor Relations Board in the Inland Steel Co. case that pensions are subject to bargaining, it was pointed out that management can always say "no" to union proposals. Many of the executives attending the conference



stressed that management should retain the administration of any pension plan adopted.

**Doubt Wide-Spread 1949 Strikes.**—Both labor and management representatives attending the conference doubted that 1949 would witness a recurrence of strikes on the 1946 scale even should industry turn a cold shoulder on the union demands.

Labor leaders pointed out that the factors which led to 1946 strikes are not present this year. First, they said, there is no issue of protecting take-home pay, and second, there is a freer climate for collective bargaining due to the absence of government interference.

Management representatives doubted that a wave of strikes would occur this year, but for different reasons. First, they asserted, union leaders are afraid the rank-and-file workers will not follow a strike order, and second, the unions have become such big business that union leaders do not want to lose the income from union dues and do not want to pay strike benefits from union treasuries.

**Concessions May Be Small.**—Most metalworking executives doubted that labor would win large advances this year, either in direct wages or in social security from industry. Consensus of hotel room conversation was that few companies would grant straight wage increases, that some would make moderate social insurance concessions, and that pension plans would enter the discussion stage with final decision delayed until 1950.

Labor leaders at the conference emphatically denied that the unions would willingly consider tying wages to the cost of living index, in an extension of the General Motors formula.

## Wage-Hour Action Upheld

POWER of the wage-hour administrator in enforcing provisions of the Fair Labor Standards Act was strengthened last week by a seven to two decision of the U. S. Supreme Court, upholding the administrator in a civil action against the Jacksonville Paper Co.

The court ruled a decree directing compliance with minimum wages, overtime and other provisions of the act need not be specific to permit the administrator to bring contempt proceedings for continued violation of the law.

The court's action had the effect of reversing a lower court decision which the wage-hour administrator had claimed casts serious doubt on

the enforceability and usefulness of hundreds of injunctions obtained under the wage-hour law.

In this case the government had brought a civil contempt action against the Jacksonville company to enforce an earlier court decision extending the wage-hour law coverage to the firm's employees. The government charged the firm had continued to violate the law by misclassifying some 20 employees as executives, employing certain piece workers in excess of 40 hours without paying them overtime, excluding from the regular rate as a bonus a legitimate wage payment, and by applying a false and fictitious method of computing overtime.

The lower courts ruled that the paper company could not be held in contempt because the injunction in the original proceeding was not directed against these specific methods of violating the act but was rather couched in general terms.

## Scrap Imports Increase

**January receipts from Germany reported 42 per cent greater than in preceding month**

SHIPMENTS of scrap from Germany to the United States amounted to 150,270 tons in January, 42 per cent more than December shipments of 105,524 tons and 85 per cent higher than November shipments of 80,709 tons.

The Joint Export Import Agency in the Bizonal area had adjusted freight differentials applying to exports of ferrous scrap from certain German inland waterway ports. The differentials range from \$2 to \$3 a ton and are deductible from the established prices of \$28.50 for steel scrap and \$45.50 for cast iron scrap.

The inland ports affected and their differentials follow: Duisberg, \$2; Dusseldorf, \$2.20; Cologne, \$2.30; Bonn, \$2.35; Mainz, \$2.40; Mannheim, \$2.50; Frankfurt, \$2.60; Karlsruhe, \$2.70; and Heilbronn, \$3.

Effective Feb. 4, the differentials applied to all future scrap metal contracts which call for delivery of tonnages f.a.s. German inland waterway ports and to contracts on which deliveries have not begun or on which deliveries have not as yet been completed.

The change in differentials was based upon changes in existing transportation and loading costs.

The January shipments included 39,369 tons of Army generated scrap and 110,901 tons of commercial scrap.

Scrap shipments from Germany to

the United States from July, 1948, through January, 1949, totaled 500,036 tons. Postwar shipments prior to July, 1948, amounted to only 4600 tons. Of the total tonnage of scrap allocated to the United States 340,000 tons of commercial scrap and 101,000 tons of Army scrap are still to be shipped.

## Republic, K-F Sign New Pact

UNDER a new arrangement Republic Steel Corp., Cleveland, will continue for five years to operate the government-owned blast furnace at Cleveland, now under lease to Kaiser-Frazer Corp., Willow Run, Mich. As a result Republic will continue in the merchant pig iron business in the North.

The furnace was the center of much controversy and concern last fall before K-F and Republic reached an agreement under which Republic is operating until May 1, 1949, the \$28 million furnace and coke plant and supplying K-F not more than 5000 net tons of iron a month, for which K-F pays the full market price.

The new arrangement, effective May 1, provides K-F with approximately 12,000 tons of pig iron a month at regular market prices. Annual capacity of the Cleveland furnace is approximately 450,000 net tons.

Also under the agreement Republic is installing at its Cleveland plant a new 200-ton open-hearth furnace, the entire cost of which is to be paid for by K-F and the output of which will be purchased from Republic by K-F in the form of sheets, approximately 7000 tons a month, at regular market prices. This arrangement, it was pointed out, will not take any steel from Republic's customers. The new open hearth is expected to be completed about August.

## Republic Expansion Denied

REPORTS that Republic Steel Corp., Cleveland, will soon announce a large-scale expansion program for its Gadsden, Ala., plant are absolutely without foundation, a spokesman for the company said. A new pipe mill was put into operation there last fall but no additional facilities are contemplated, he pointed out.

Highly pleased with this electric-weld line pipe mill, Republic officials have, however, considered establishment of another pipe mill but the matter is only in the discussion stage, with no thought having crystallized as to a possible location.



# Steel Earnings Increase

**Consolidated 1948 net income of 14 leading producers shows substantial gain over 1947**

REFLECTING increased capacity, near-capacity operations and upward adjustments in steel prices, the steel industry's net income increased in 1948 compared with 1947.

A compilation by STEEL shows 14 ingot producers representing approximately 78 per cent of the nation's ingot capacity had aggregate net earnings of \$445,570,447 in 1948, compared with \$335,434,298 in 1947. Eleven companies reported sales in 1948 totaling \$6,091,591,770 and net earnings aggregating \$397,669,684, with a result net earnings were at the rate of 6½c per dollar of sales. The rate was 6c in 1947 when those 11 companies had aggregate sales of \$5,033,580,171 and net earnings of \$302,708,642.

Each of the 14 companies with fiscal years ended Dec. 31 showed 1948 net income exceeding that of 1947

and fourth-quarter net income surpassing that of the third quarter of 1948 and the fourth quarter of 1947.

**Capacity Increased**—Helping the steel industry raise its net earnings was a 3-million-ton increase in the nation's ingot capacity, the total in 1948 being 94,233,460 net tons, compared with 91,241,230 in 1947. This increased capacity was utilized to a slightly greater extent than the 1947 capacity, operations in 1948 averaging 93.9 per cent of capacity, compared with 92.9 per cent the previous year. Significant among upward price adjustments in 1948 were those early in the second half when base prices were increased and shortly thereafter when mills discontinued absorbing freight charges.

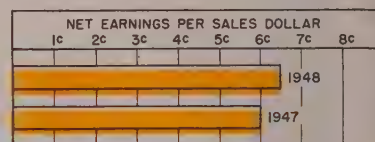
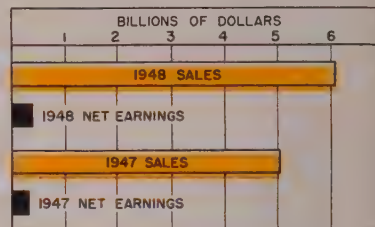
Accompanying the higher rate of operations in 1948 were higher costs of doing business, substantial increases occurring in expenditures for wages, materials and income taxes.

## Railroad Income Rises in 1948

NET railway operating income of Class I railroads in 1948, before in-

## Sales and Net Earnings

(11 Steel Producers)



terest and rentals, was \$1,002,352,323, representing a rate of return on net property investment of 4.38 per cent. Estimated net income, after interest and rentals, was \$711 million.

Corresponding 1947 figures were: Net railway operating income, \$780,438,283; rate of return on net property investment, 3.46 per cent; estimated net income, \$498 million.

## SUMMARY OF 1948 NET EARNINGS IN STEEL INDUSTRY

	Year Ended Dec. 31		Fourth Qtr.		Fourth Qtr.	
	1948	1947	1948	1948	1947	1947
Barium Steel Corp.	\$2,818,182	\$1,689,213	\$1,095,622	\$841,197	\$498,810	
Bethlehem Steel Corp.	90,347,560	51,088,375	37,163,702	22,584,752	12,377,647	
Continental Steel Corp.	1,625,150	1,296,874	597,641	407,838	298,384	
Granite City Steel Co.	3,267,707	1,941,899	857,057	776,333	790,518	
Inland Steel Co.	38,606,899	29,888,558	13,787,373	9,811,133	8,096,975	
Jones & Laughlin Steel Corp.	31,222,451	19,225,184	10,973,134	8,757,416	5,700,853	
National Steel Corp.	40,121,506	26,838,788	12,920,071	11,175,400	6,935,133	
Portsmouth Steel Corp.	4,511,550	3,944,969	1,470,989	1,107,101	1,003,838	
Republic Steel Corp.	46,438,382	31,018,400	16,625,594	12,874,398	7,906,770	
Rotary Electric Steel Co.	2,196,859	703,360	732,203	516,303	156,777	
U. S. Steel Corp.	129,552,424	127,098,148	41,510,274	34,599,132	29,397,811	
Wheeling Steel Corp.	15,050,045	12,445,161	5,358,400	3,866,913	4,014,900	
Alain Wood Steel Co.	4,100,000	1,955,446	1,716,110	1,109,534	522,325	
Youngstown Sheet & Tube Co.	35,711,732	26,299,923	12,372,402	8,806,000	6,853,087	
<b>Totals</b>	<b>\$445,570,447</b>	<b>\$335,434,298</b>	<b>\$157,180,572</b>	<b>\$117,233,450</b>	<b>\$84,553,828</b>	
<b>Steel Producers with Fiscal Years Ended at Dates Other than Dec. 31:</b>	<b>Fiscal Years Ended in</b>		<b>Fourth Qtr.</b>	<b>Third Qtr.</b>	<b>Fourth Qtr.</b>	
	<b>1948</b>	<b>1947</b>	<b>1948</b>	<b>1948</b>	<b>1947</b>	
§A. M. Byers Co.	\$2,331,034	\$1,685,093	\$737,200		\$480,780	
†Carpenter Steel Co.	2,548,071	1,629,206	656,616	\$522,508	341,789	
†Colorado Fuel & Iron Corp.	6,181,777	5,088,676	3,270,597	2,425,660	1,740,110	
†Keystone Steel & Wire Co.	4,311,476	4,837,955	922,349	860,238	1,110,058	
‡Lukens Steel Co.	2,411,604	2,697,117				
<b>Finishing Capacity Only:</b>	<b>Year Ended Dec. 31</b>		<b>Fourth Qtr.</b>	<b>Third Qtr.</b>	<b>Fourth Qtr.</b>	
	<b>1948</b>	<b>1947</b>	<b>1948</b>	<b>1948</b>	<b>1947</b>	
Acme Steel Co.	\$7,216,627	\$7,524,887	\$2,114,357	\$1,660,269	\$2,164,468	
Superior Steel Corp.	966,319	1,116,419	139,621	274,848	175,004	
Thomas Steel Co.	1,801,146	1,688,858	443,654	403,008	266,923	
<b>Fig Iron Capacity Only:</b>	<b>Year Ended Dec. 31</b>		<b>Fourth Qtr.</b>	<b>Third Qtr.</b>	<b>Fourth Qtr.</b>	
	<b>1948</b>	<b>1947</b>	<b>1948</b>	<b>1948</b>	<b>1947</b>	
Interlake Iron Corp.	\$5,934,642	\$4,558,847	\$2,295,764	\$1,268,684	\$1,107,667	

§ Year ended Sept. 30. † Year ended June 30. ‡ Years ended Oct. 30, 1948, and Oct. 4, 1947.



# Plant Expansion Stalled

New York state manufacturers  
shelve programs pending clarifi-  
cation of f.o.b. pricing issue

CONFUSION resulting from the United State Supreme Court's decision outlawing basing point pricing in the cement industry is stymying plans for expansion of manufacturing plants in New York state, Commissioner Harold Keller, New York State Department of Commerce, says in a report on a survey of manufacturers.

He points out the change in pricing methods by the steel industry makes the cost of steel different to purchasers according to their distance from the steel plant, instead of a flat delivered price, with freight absorbed, according to basing point areas.

No plant migrations from New York state resulting from the basing point decision were uncovered by the survey, but several companies reported they have shelved expansion plans pending clarification of the issue.

Some manufacturers indicated that universal f.o.b. mill pricing would adversely affect purchase of materials. Some reported they would lose customers in distant markets since they would not be able to lower prices sufficiently to meet local competition.

**Potential Loss Small**—The report shows that although effects of the decision will be extremely serious for some manufacturers, particularly those using large quantities of iron and steel, the total potential loss in business to all New York state plants under present conditions would be less than 1 per cent. This loss would result if changes in pricing methods were retained and f.o.b. mill pricing were not made mandatory upon all manufacturers. Under complete mandatory f.o.b. mill pricing, the loss anticipated by upstate manufacturers would be between 4 and 8 per cent, and the loss in New York city between 1 and 2 per cent.

The survey points out strongly the importance of proximity to markets in industrial location under f.o.b. mill pricing. Thus, the report continues, although manufacturers now located in the state anticipate some loss of business under the extreme assumption of universal f.o.b. mill pricing, such a general shift in pricing practices could result in a net increase in the total volume of manufacturing business carried on in the state. New York state is the largest consuming market in the country and some manufacturers now located

elsewhere probably would find it advantageous to move to or open branch plants in the state.

## Allocations Meeting Set

SUBJECT matter of the next voluntary agreements conference by the Office of Industry Cooperation with the Steel Products Industry Advisory Committee, Feb. 24, will be largely inspired by Congress. In line with a promise to the House Banking Committee, Secretary of Commerce Sawyer will call for discussion of the steel needs of "distressed" municipalities, and, due to complaints received by congressmen from constituents who still have difficulty in obtaining needed steel, Mr. Sawyer will feel out the possibilities for providing help in all such cases. He may revive the suggestion for an arrangement under which the iron and steel warehouses would co-operate in taking care of these cases.

An ECA request for an allocations program calling for some 260,000 tons of steel per quarter is expected to be taken up but no difficulty is likely here because ECA shipments without allocation have been larger. Incidentally, the expected ECA request represents a reduction from previous estimates.

Otherwise the agenda for the meet-

ing is not definite. Extension of the allocations program for the warm air heating industry, possibly at a reduced tonnage level, may be recommended. Requirements of certain reclamation projects may be discussed if the Interior Department is prepared to make a request. The railroad car program most certainly will be mentioned but without any accompanying requests. Commerce Department officials think the fact the railroads are not ordering cars in anywhere near the numbers permitted under the existing allocations program which provides enough steel for 10,000 freight cars a month (January orders, according to the American Railway Car Institute, came to 1568 cars) proves that the agreement need not be increased to permit construction of 12,000 cars.

Whether Interior Department will renew its request for allocations covering pipelines and oil country tubular goods is not yet clear. Interior recently asked the National Petroleum Council to review the needs in those fields and the report probably will not be ready for the Feb. 24 meeting. It also is considered unlikely the recent request for an agreement covering steel for oil terminal storage tanks will be revived at this time.

## Steel Facilities in 30 States

MAP of the steel industry today shows mills and furnaces are now spread over 30 states compared with 27 in 1938.

More than 400 plants, producing or finishing iron or steel in 250 communities, are scattered through those 30 states which have 85 per cent of the nation's population. This does not take into account location of raw material operations or other facilities not directly engaged in steel production. In 1938 the total number of steel plants was only 360.

Ten years ago Florida and Iowa were not on the steel map. Both now have finishing capacity without becoming steel ingot makers.

California has become one of the first ten producing states. It is first in reinforcing bar capacity and makes seven products which it did not produce in 1938. Texas is now a producer of a diversity of products. Indiana has become the state with the largest tin and terne plate capacity; Wisconsin is second largest in electric weld pipe and tube capacity; Illinois has assumed leadership in plain and galvanized wire capacity; Utah is fourth in plate capacity, exceeded by Pennsylvania, Indiana and Illinois. The new facilities in Florida and Iowa are wire mills.



**FASTER CUTTING:** This slag-incrusted skull, 57 x 72 inches, was cut in half in 80 minutes by power cutting, using Linde Air Products' new Oxweld cutting blowpipe. Conventional lancing techniques would have required five to eight times as long



# Steel Distribution Pattern Criticized

Senate subcommittee on small business issues report on the results of its extensive investigation of the steel supply situation

DECLARING its investigation shows the pattern of steel distribution is alarming, a Senate subcommittee urges steel company managements to revise distribution policies so as to strike a better balance between interests of private profit and national welfare.

The subcommittee, headed by Edward Martin (Rep., Pa.), was a part of the Senate's Special Committee To Study Problems of American Small Business, and made its investigation after extensive hearings indicated withdrawal of distribution by major steel companies and increased integration in the steel in-

dustry had left many smaller businesses without sources of steel supply. The subcommittee died Jan. 31, and efforts are being made to revive it.

**Committee's Findings**—Using data submitted by 14 major steel producers and centering its study on four principal points of issue, the committee found:

1. Steel companies have significantly increased the proportion of steel allotted to their own fabricating subsidiaries.

2. Steel companies have made a significant shift in distribution of steel in favor of their own ware-

houses, the shift being particularly pronounced in the most critical products.

3. Strong reasons to believe steel companies have taken advantage of the extraordinary postwar demand to increase greatly the production of the more expensive and apparently more profitable steel products, at the expense of the lower-priced types.

4. No substantial difference of opinion between small business and the steel industry as to drawing-in of steel shipments closer to centers of steel production, but a substantial difference, however, in opinion on extent and importance.

**Fabricating Subsidiaries** — In its study the subcommittee found that for the products surveyed, as a group, shipments to fabricating subsidiaries of the steel companies, as a per cent of total shipments, rose from 7.5 per cent in 1940 to 8.3 per cent in 1947. The increase was much more pronounced, said the subcommittee,

SHIPMENTS OF HOT-ROLLED SHEETS TO VARIOUS CONSUMING DISTRICTS IN 1940 AND 1947

Consuming district	Net product tons 1940	1947	Percent change
Total all states	4,477,457	5,319,858	18.8
Maine	1,461	859	-41.2
New Hampshire	8,396	9,580	14.1
Vermont	1,282	1,206	-5.9
Massachusetts	59,991	80,671	34.5
Rhode Island	2,212	2,106	-4.8
Connecticut	37,161	57,691	55.2
New Jersey	99,414	93,102	-6.4
New York city area	91,244	93,916	2.9
All other New York	131,956	123,299	-6.6
Philadelphia area	227,358	186,288	-18.1
All other Pennsylvania	232,357	372,810	60.4
West Virginia	39,352	157,506	300.2
Delaware	736	7,806	960.6
Maryland	105,466	223,899	112.3
District of Columbia	1,038	1,948	87.7
Virginia	12,342	15,107	22.4
Cleveland area	283,305	298,100	5.2
Canton, Massillon, Mansfield	52,553	65,285	24.2
All other Ohio	394,262	486,315	23.3
Kentucky	9,063	22,874	152.4
Indiana	181,796	236,945	30.3
Chicago area	281,274	470,388	67.2
All other Illinois	103,092	130,076	26.2
Detroit area	1,170,172	1,174,858	.4
All other Michigan	153,397	86,528	-43.6
Wisconsin	294,429	277,984	-5.6
Missouri	78,329	80,158	2.3
Iowa	27,614	43,700	58.3
Minnesota	25,792	41,406	60.5
Kansas	5,294	10,586	100.0
Nebraska	3,823	9,143	139.2
South Dakota	206	257	24.8
North Dakota	623	779	25.0
Montana	990	1,922	94.1
Idaho	1,330	858	-35.5
Wyoming	43	346	704.7
Colorado	4,568	9,039	97.9
Alabama	24,651	46,778	89.8
Georgia	9,086	8,667	-4.6
Florida	2,982	6,908	131.7
Mississippi	1,409	3,461	145.6
North Carolina	4,852	6,049	24.7
South Carolina	1,280	2,040	59.4
Tennessee	27,113	38,305	41.3
Arkansas	1,248	2,399	92.2
Oklahoma	6,907	14,564	110.9
Louisiana	44,176	22,604	-48.8
Texas	73,733	65,392	-11.3
New Mexico	471	725	53.9
Utah	1,611	2,681	66.4
Nevada	327	87	-73.4
Washington	12,957	18,017	39.1
Oregon	9,179	9,892	7.8
California	130,274	194,542	49.3
Arizona	1,480	1,406	-5.0

SHIPMENTS OF SELECTED CARBON-STEEL PRODUCTS TO WAREHOUSES

[Net product tons]

	Shipments to affiliated warehouses 1		Shipments to all warehouses 2		Shipments to affiliated warehouses as per cent of shipments to all warehouses	
	1940	1947	1940	1947	1940	1947
<b>Sheets:</b>						
Hot-rolled	36,183	172,599	391,005	708,163	9.3	24.4
Cold-rolled	10,475	93,022	234,621	403,143	4.5	23.1
<b>Strip:</b>						
Hot-rolled	6,254	18,615	39,115	102,350	16.0	18.2
Cold-rolled	38	4,078	4,839	25,892	.8	15.7
<b>Bars:</b>						
Hot-rolled	197,923	352,236	652,052	1,372,429	30.3	25.7
Cold-finished	1,938	7,373	37,452	130,679	5.2	5.6
<b>Pipe:</b>						
Buttweld	72,457	253,438	772,138	1,281,778	9.4	19.8
Lapweld	17,688	18,310	82,024	129,609	21.6	14.1
Seamless	161,907	190,397	488,425	684,275	33.1	27.8
<b>Tubing:</b>						
Electrical welding	154	1,283	15,267	46,321	1.0	2.8
Mechanical and pressure	1,422	2,718	53,500	157,867	2.7	1.7
Structural shapes	79,570	226,348	365,914	904,249	21.7	25.0
Plates	61,669	174,424	230,329	655,560	26.8	26.6
<b>Wire products:</b>						
Drawn wire	2,386	15,818	107,647	189,998	2.2	8.3
Wire nails and staples	11,654	4,229	316,942	474,129	3.7	.9
Barbed and twisted wire	1,195	1,187	75,633	122,032	1.6	1.0
Woven wire fence	1,177	2,328	135,350	241,887	.9	1.0
Bale ties	792	1,188	14,952	36,445	5.3	3.3
<b>Total</b>	<b>664,882</b>	<b>1,539,591</b>	<b>4,017,205</b>	<b>7,666,806</b>	<b>16.5</b>	<b>20.1</b>

<sup>1</sup> Includes shipments to all warehouses which are wholly owned or partially owned (i.e., ownership of 10 per cent or more of the voting stock) by a steel company, any of its subsidiary firms, its parent company, or by other subsidiaries of its parent company.

<sup>2</sup> Includes shipments to affiliated warehouses and all other warehouses, jobbers, dealers, and distributors.

SHIPMENTS OF SELECTED HOT-ROLLED AND COLD-ROLLED CARBON STEEL PRODUCTS:

	1940		1947		Per-centage of product group	Per-centage of product group	Per-centage increase, 1940-47
	Tons	Per-centage of product group	Tons	Per-centage of product group			
<b>Sheets:</b>							
Hot-rolled	5,460,168	69.7	6,207,519	57.1			13.7
Cold-rolled	2,328,022	30.3	4,658,684	42.9			100.1
<b>Strip:</b>							
Hot-rolled	1,082,507	82.6	1,332,513	67.2			23.1
Cold-rolled	228,046	17.4	649,488	32.8			184.8
<b>Bars:</b>							
Hot-rolled	4,260,504	95.9	5,886,572	93.7			38.2
Cold-finished	183,220	4.1	393,715	6.3			114.9

<sup>1</sup> Represents total shipments, including shipments to other members of the industry for conversion and shipments to warehouses, and shipments for export.



# SHIPMENTS OF HOT-ROLLED SHEETS IN 1940 AND 1947: COMPARING CHANGES IN DISTRIBUTION TO PRODUCING AREAS AND NONPRODUCING AREAS

Surplus-producing areas:	1940	1947	Per Cent change
New York (excluding New York city) ..	131,956	123,299	- 6.6
Cleveland .....	283,305	298,100	5.2
Other Ohio .....	394,262	486,315	23.3
Canton-Massillon-Mansfield .....	52,553	65,285	24.2
Indiana .....	181,796	236,945	30.3
Pennsylvania (excluding Philadelphia) ..	232,357	372,810	60.4
Chicago .....	281,274	470,388	67.2
Alabama .....	24,651	46,778	89.8
Maryland .....	105,466	223,899	112.3
Kentucky .....	9,063	22,874	152.4
West Virginia .....	39,352	157,506	300.2
Subtotal .....	1,736,035	2,504,199	44.2
Deficit-producing areas:			
Philadelphia .....	227,358	186,288	-18.1
Detroit .....	1,170,172	1,174,858	.4
Missouri .....	78,329	80,158	2.3
Illinois (excluding Chicago) .....	103,092	130,076	26.2
California .....	130,274	194,542	49.3
Subtotal .....	1,709,225	1,765,922	3.3
All other areas .....	1,032,197	1,049,737	1.7
Total all areas .....	4,477,457	5,319,858	18.8

# SHIPMENTS OF SELECTED CARBON-STEEL PRODUCTS TO FABRICATING SUBSIDIARIES<sup>1</sup>

(Net product tons)			
1940		1947	
Tons	Shipments to fabricating subsidiaries as per cent of total shipments <sup>2</sup>	Tons	Shipments to fabricating subsidiaries as per cent of total shipments <sup>2</sup>
Sheets:			
Hot-rolled .....	310,376 5.7	651,423 10.5	
Cold-rolled .....	59,261 2.5	255,894 5.5	
Strip:			
Hot-rolled .....	16,126 1.5	49,315 3.7	
Cold-rolled .....	4,274 1.9	17,334 2.7	
Structural shapes .....	600,662 19.1	771,012 18.0	
Plates .....	378,085 11.4	468,922 9.9	
Bars:			
Hot-rolled .....	72,243 1.7	93,684 1.6	
Cold-finished .....	3,805 2.1	3,673 .9	
Pipe:			
Buttweld .....	2,583 .2	3,068 .2	
Lapweld .....	3,466 2.1	620 .3	
Seamless .....	3,883 .4	1,404 .1	
Tubing:			
Electric welding .....	79 .1	54 ...	
Mechanical and pressure ..	316 .2	660 .2	
Total .....	1,455,159 7.5	2,317,063 8.3	

<sup>1</sup> Includes shipments to all steel-consuming firms which are wholly owned or partially owned (i.e., ownership of 10 per cent or more of the voting stock) by a steel company, any of its subsidiary firms, its parent company, or by other subsidiaries of its parent company.

<sup>2</sup> Total shipments exclude shipments to warehouses and other steel companies for the purpose of further conversion or resale.

in the case of steel products which constitute the principal raw materials consumed by the fabricating companies that have been acquired—specifically, hot-rolled sheet, cold-rolled sheet, and hot-rolled strip. Shipments of hot-rolled sheet to fabricating subsidiaries rose from 310,376 net tons in 1940, or 5.7 per cent of the total shipments of that product, to 651,423 net tons, or 10.5 per cent of total shipments of that product, in 1947. Other comparisons of shipments to fabricating subsidiaries include: Cold-rolled sheet, 59,261 tons, or 2.5 per cent, in 1940, and 255,894 tons, or 5.5 per cent in 1947; hot-rolled strip, 16,126 tons, or 1.5 per cent, in 1940, and 49,315 tons, or 3.7 per cent, in 1947.

In the case of all other steel products surveyed, with two exceptions, the amounts which flowed to fabricating subsidiaries were negligible in both the prewar and postwar periods, constituting less than 3 per cent

of the shipments of the product in each period. These two exceptions—plates and structural shapes—were characterized by slight decreases in the proportions flowing to the fabricating subsidiaries, a decline which the subcommittee said probably reflected the relatively lower rate of shipbuilding.

**Warehouse Tonnage** — Of the 18 steel products covered in the study on shipments to warehouses, the committee found that of shipments to all warehouses the proportion going to steel companies' warehouses rose from 16.5 per cent in 1940 to 20.1 per cent in 1947. The shift was particularly pronounced in sheet and strip. Of shipments to all warehouses the volume of hot-rolled sheet going to steel company warehouses rose from 9.3 per cent in 1940 to 24.4 per cent in 1947; cold-rolled sheet, from 4.5 per cent to 23.1 per cent; hot-rolled strip, from 16.0 per cent to 18.2 per cent; and cold-rolled

strip, from 0.8 per cent to 15.7 per cent.

As to shift in product pattern, the subcommittee found that cold-rolled sheet shipments were 2,328,022 tons in 1940 but 4,658,684 in 1947, a 100.1 per cent increase, and that hot-rolled sheet shipments were 5,460,168 tons in 1940 and 6,207,519 tons in 1947, only a 13.7 per cent rise. Similarly, cold-rolled strip increased 184.8 per cent and hot-rolled strip only 23.1 per cent, and cold-finished bars jumped 114.9 per cent while hot-rolled bars rose 38.2 per cent. However, all of the evidence presented by small business, said the committee, indicates demand for the hot-rolled types appears to be considerably greater than for cold-rolled.

Concerning shifts in geographic distribution of steel, the subcommittee says: 1. Producers in surplus-producing areas are selling a greater portion of their output to nearby purchasers; 2. shipments to deficit producing centers have either declined or risen only slightly; and 3. behavior in nonproducing areas has varied widely.

## Demand for Boilers Spurts

SALES of boilers and oil burner combinations increased to a new high during January, according to E. DeSiena, vice president, Superior Combustion Industries Inc., New York. Inquiries for new boilers also set a new high last month.

The current strong demand is attributed by Mr. DeSiena to the following: Much long-deferred plant maintenance is being pushed, involving installation of equipment formerly in short supply; generation of a large volume of equipment business by the nationwide public utility expansion program; installation of equipment in many public institutions, schools, hospitals and government buildings; continuing strong demand from Brazil, Peru and other countries.

Return to active competitive conditions in several industries has made it imperative to lower operating costs. Many mills, such as textile, were so pressed during recent years to maintain peak production they did not have time to replace worn-out plant equipment. Now that they have a "breathing spell," they are buying equipment to restore prewar efficiency and economy.

The boiler industry is now able to make prompter delivery because of improvement in availability of steel and boiler fittings, Mr. DeSiena said. A reduction of prices from 7½ to 10 per cent in cast iron fittings early in February eased buying resistance.



## Marshall Plan's success in promoting recovery in Europe no assurance it alone can achieve political and social stability abroad, National Planning Association warns

SATISFACTION with the Marshall Plan's initial success in advancing western Europe's economic recovery should not lead to overestimates of what the Marshall Plan alone can do to achieve political and social stability in western Europe, the National Planning Association warns in two complementary reports by members just issued.

One report, a "Joint Statement on the Marshall Plan," is approved by 48 members of the NPA Board of Trustees and its Agriculture, Business, Labor, and International Committee members. The other is a 17-page study, "Beyond the Marshall Plan," by Dr. John Kenneth Galbraith, professor of economics, Harvard University, for the association's International Committee. Both reports express confidence the Marshall Plan is succeeding.

**Other Problems** — "The achievements of this first year clearly suggest both the soundness of the original conception of the Marshall Plan and the importance of carrying it forward in broad accordance with the original design," the Joint Statement says. However, "The achievement of physical recovery is not the only problem of western Europe, nor can it be the only objective of American foreign policy with respect to the free nations. Western Europe has problems which economic recovery will not solve, but which, if freedom and stability are to be assured must be solved."

Of the political trends in Europe, Dr. Galbraith says, "There is a chance recovery will check the polarization of European political life, concentration of strength at the extreme left and extreme right, but it would be idle to count on it. The trend is not a superficial one; it is deeply rooted in the economic and social life of Europe and long antedates the war."

**Beyond Marshall Plan**—To assure that the Marshall Plan will have maximum effectiveness in promoting lasting European recovery, free peoples in Europe and the United States should now turn to solution of these problems which lie beyond the Marshall Plan:

1. Expanding Welfare; Reform—

Under these two headings the Joint Statement and the Galbraith report express agreement that needed reforms in western Europe raise problems of political and social stability.

2. Economic Tolerance; the Political Problem—Both reports urge U. S. tolerance of experiments by other free countries in working out their different forms of economic organization.

3. Economic Unity—Both reports stress the serious difficulties in the solution of the problems of nationalism.

4. Economic Development; Will the Marshall Plan Bring Recovery? — Both reports conclude that the road to western Europe's recovery and financial independence leads beyond the Marshall Plan itself.

It would be wrong, Dr. Galbraith says, to conclude that the Marshall Plan will provide a "full cure" for western Europe's economic independence. "On the contrary, it would be a great tragedy were the success or failure of the Marshall Plan identified exclusively with its success or failure in establishing a self-supporting balance in western Europe's external accounts. The ECA will have been a brilliant success if it helps get western Europe past the next four years without disorder; if it helps to secure the position of modern governments; and if it helps achieve for Europeans the promise of a decent and improving standard of life."

## Asks Congress for Tax Relief

IN A MESSAGE to the members of the House Ways & Means Committee last week, C. W. Harder, president, National Federation of Small Business, called for tax relief for small, independent businesses.

Pointing out that over the past two years, the nationwide, small, independent business and professional membership of the federation have voted favorably on bills to afford such relief, Mr. Harder called attention to two bills approved unanimously as small business relief measures by the House Small Business Committee of the 80th Congress, and recommended for action in the 81st Congress.

The first, H.R. 4407 (80th Con-

gress), would grant excise taxes from manufacturers selling at retail the same as from independent competitors, which is not now the case. The second, H.R. 5818, would exempt from taxation the first \$25,000 of corporate income and would provide that a normal tax and surtax rate of 38 per cent apply to corporate incomes up to \$50,000. In past mandate ballots, 95 per cent of federation members called for favorable action on H.R. 4407, and 85 per cent called for similar action on H.R. 5818.

Mr. Harder focused attention also on S. 1921 (80th Congress), a bill to exempt from federal taxation the first \$10,000 spent in any one year for productive business improvements, on H.R. 5143 (80th Congress), a bill to equalize tax collections as between corporate and unincorporated business, and on S. 1827, a bill to permit optional 5-year depreciation on land, buildings, and equipment.

In his message Mr. Harder stressed the fact that small business is now becoming more hard-pressed than at any time in recent years. He noted that the business mortality rate is climbing constantly. He told Committee members prompt action by them, and by the Congress, could go far to relieve the pressure on these merchants.

## Labor Adviser to ECA Mission

APPOINTMENT of Joseph F. Heath as a labor adviser to the ECA Mission in Greece has been announced by Paul G. Hoffman, Economic Cooperation Administrator. Mr. Heath is the second labor adviser to be appointed to the Greek Mission; Alan Strachan, who has been on duty there for some time, was the first.

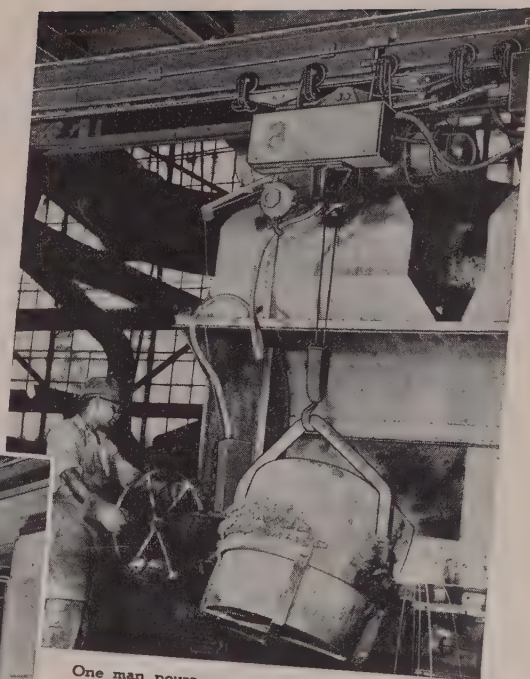
Mr. Heath is on leave from his position as National Representative of the American Federation of Government Employees, a position he has held since 1946. His experience includes analyzing material procurement systems, management procedures, and making recommendations for appropriate changes in the Philadelphia Navy yard.

## Symposium on Corrosion

THOSE desiring a mimeographed copy of proceedings at the symposium on corrosion held Feb. 3 and 4 under the sponsorship of the Office of Naval Research should send their

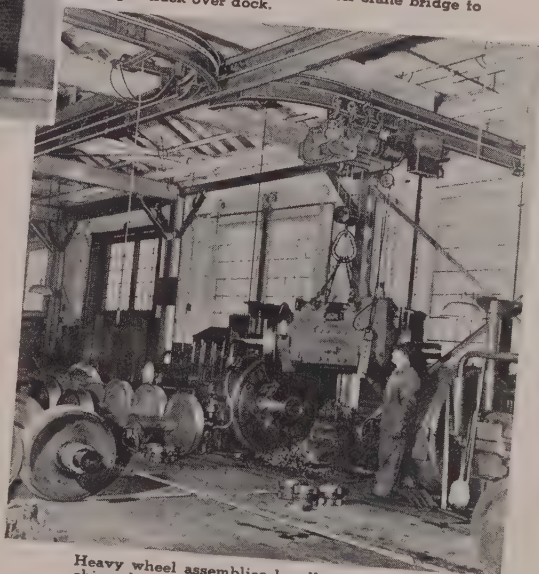


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requests to the Deterioration Prevention Committee, National Academy of Sciences, 2101 Constitution Avenue N. W., Washington 25, D. C. Several weeks will elapse, however, before they are ready to be sent out.

Participated in by government scientists, much data were put in the record as to ways and means of increasing corrosion resistance of metals—as protective coatings on food cans, razor blades, water buckets, etc., new painting techniques to protect ship hulls against corrosion, ceramic coatings for the protection of metals at high temperatures, underground corrosion, corrosion in airplanes, etc.

The hundreds of readers of STEEL who wrote the Office of Naval Research for copies of the volume covering the Titanium symposium held Dec. 16, now can expect to receive copies early in April. The proceedings will fill a 200-page printed book, and copies will be supplied by the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at a price not yet fixed but expected to be under \$1 per copy.

## Trade Executives Drop Fight

LAST year's excitement among certain trade association executives over the action of the Office of Industry Cooperation in banning such executives from attendance at its conferences with the steel industry in connection with voluntary allocations programs appears to have subsided.

These men were very irate over the ban. They felt members of industry advisory committees called into these conferences enjoyed an unfair advantage. The executives wanted to attend and thus be in a position to provide members of their associations with first-hand, accurate, comprehensive reports of what went on at the meetings.

Reason for dropping the fight is the realization among trade association executives that the OIC—acting on an oral opinion from the Department of Justice seems to be the only government agency which bans such executives. Elsewhere in the government, trade association men are welcomed—in Interior, Commerce, Agriculture and, in fact, all departments. They take an active part in the industry conferences of the Munitions Board and the National Security Resources Board, and they are in the forefront in industry contacts with the armed services.

Majority feeling among trade association executives seems to be: There is no sense in endangering our fine status with 99 per cent of the

government by putting on a big fight in connection with the 1 per cent exception.

## Study of Steels Advanced

ADVANCING further its studies to determine what can be expected of different steels in specific uses, the Army Ordnance Department has launched an investigation of the properties of cold worked steel, both carbon and alloy. The work is being done under contract by the Case Institute of Technology, Cleveland. Initially, with the co-operation of a manufacturer of cold drawn steel, the study is being confined to bars. Later, with the co-operation of a tubing manufacturer, it will be extended to include cold-drawn tubing.

An investigation of temper brittleness of alloy steels in heavy sections, under way at the arsenal at Watertown, Mass., has reached a stage where a preliminary report of conclusions will be prepared in the near future.

## Orthonol Now in Production

ANOTHER product of government scientific research work now is in commercial production and generally available to consumers. This is Orthonol, a soft magnetic alloy containing 50 per cent nickel and 50 per cent iron, developed by the Naval

Ordnance Laboratory. It is being produced for the market by Allegheny Ludlum Steel Corp. and the Armco Steel Corp. Incidentally, magnetic properties of the material have been greatly improved in the past couple of months as a result of a new combination directional rolling and heat treatment process.

Principal uses of Orthonol are in electrical current rectifiers and in magnetic amplifiers. In the latter use, Orthonol coils serve as nondestructible replacements for fragile electronic tubes. A typical application is in underwater mines which in the past have frequently failed to function due to breakage of tubes when the mines were dropped into the sea from airplanes. Several other uses of Orthonol not yet ready for public announcement are under investigation.

Orthonol represents a development of the German Permenorm 5000-Z which, in turn, was a development of the original Permalloy brought into existence by Dr. G. W. Elmen, formerly with Bell Telephone Laboratories, New York. After World War II, samples of Permenorm were brought to the Naval Ordnance Laboratory where the Magnetic Materials Subdivision, of which E. A. Gaugler is head, launched a research study; Dr. Elmen, in the capacity of consultant, has assisted in the development.

**BIG LIFT:** Floating crane at the Long Beach, Calif., naval shipyard, is shown lifting a loaded barge weighing 425 tons, equal to 283 autos weighing 3,000 pounds each. Crane is equipped with eight 2½-inch Jones & Laughlin wire rope slings. Crane's own barge, which has a surface of two-thirds of an acre, tilted only a few degrees in picking up the weight





# Foreign Trade in Europe Gains

**Britain leads as exporter in 1948. French trade includes imports of American technical know-how. German capital goods makers' foreign order backlogs large**

EUROPE's concentration upon foreign trade is showing concrete results, not only in the area of exports, but also in the realm of imports.

British exports of iron and steel products set new records in 1948. French trade is picking up, including imports of American technical processes and equipment to increase metalworking production. German makers of steel mill equipment and other apparatus have backlogs of foreign orders extending, in some cases, for three years.

## Great Britain

BRITAIN's exports of iron and steel were at a record high in 1948 at 2,010,315 tons, compared with 1,876,978 tons in 1947. Sheets and tin plate showed the greatest tonnage increase, while one product, pig iron, decreased from 42,521 tons exported in 1947 to only 1504 tons shipped overseas last year.

Automobiles lead as the nation's chief manufactured export. More than 227,000 cars, 71,000 trucks and tractors and 4100 busses, coaches and trolley busses went to foreign buyers during the year. In December alone, the auto industry shipped \$36 million worth of cars and trucks abroad. Total revenues from exports during the year for all classes of goods amounted to \$584 million, \$240 million more than in 1947.

In 1948 a total of 567,553 tons of iron and steel was imported, compared with 516,817 tons in 1947. Semi-finished steel imports dropped, however, from 201,221 tons in 1947 to 162,519 tons in 1948. Steel ingot imports also fell, from 111,767 tons in 1947 to 19,180 tons last year. The semifinished steel imports may rise this year as Britain has just concluded a new trade agreement with Belgium and Luxemburg which calls for heavy shipments of Belux steel products, chiefly semifinished, to England.

British steel ingot and casting production in January was at the annual rate of 15,002,000 tons compared with the rate of 14,589,000 tons achieved in January, 1947. January pig iron output was at the rate of 9,262,000 tons annually, compared with a rate of 8,726,000 tons in January, 1947.

The Iron & Steel Federation re-

ports that excellent progress had been made in the expansion plans which will give Britain an annual steel output of 17.5 million tons by 1953-54. This output, with about 500,000 tons of steel imports, should be sufficient for the nation's economy, the federation says.

One of the major steel expansion programs, at Round Oak Steelworks in the Midland area, should be completed and in operation by the end of the year. The \$13 million project will almost double production at this facility.

The expansion programs go on despite the threat of steel nationalization. The measure to effect government ownership is still being discussed in Parliament, the warmest debate having been aroused recently over why Ford Motor Co., which operates a large blast furnace, has been omitted from the list of companies to be nationalized. The government denied that American pressure was responsible for this omission and pointed out that Ford is an automaker primarily and that the entire auto industry will be unaffected. Shortly after this discussion, four other firms, engaged in manufacture of finished products and not primarily iron and steel producers, were also dropped from the list.

## France

A FRENCH steelmaker in the Lorraine district, Societe Metallurgique de Senelle Maubeuge, has been licensed to use the Avery-Little process and will install a top pressure system, the object of this American patent, on a blast furnace at its Longwy plant.

Several other firms have expressed interest in oxygen techniques for increasing blast furnace production, and American methods to concentrate iron ores are under study.

A major import by the French coal industry has been six giant six-meter coal hoists constructed in Birmingham by Hardie-Tynes Mfg. Co. more than a year ago for Russia. Maurice Car, chief of the French Mining Equipment Purchasing Office, Washington, closed the purchase. The machines are capable of hoisting 24,000 pounds of coal every 45 seconds. They are grooved to carry a cable 2.5 inches in diameter and to work from

two levels—one 820 feet and another 1900 feet.

French exports are also active and have regained their prewar levels. This is primarily because production has jumped. More than 682,000 metric tons of pig iron were produced in December, compared with 655,000 tons in November. December's output index was 136 in relation to average monthly production of 1938 and 79 with reference to output in 1929. More than 702,000 tons of steel ingots and castings were turned out in December, which brought the index to 106 with reference to 1939, 135 with 1938 and 87 with 1929. For rolled products 510,000 tons were produced in December, compared with 544,000 tons, the monthly average for 1929. December's production of plates and sheets exceeded the 1929 average.

## Western Germany

THE DEMAG firm at Duisburg in the Ruhr is being swamped with foreign inquiries and orders for steel mill equipment, as are several other companies which make a wide variety of metalworking production machinery.

In the case of Demag, foreign customers pay large down payments or even pay completely in advance for equipment which can't be delivered for two or three years. Because of this situation, this and other capital equipment makers, unlike most Ruhr plants, can carry on extensive rehabilitation and expansion programs.

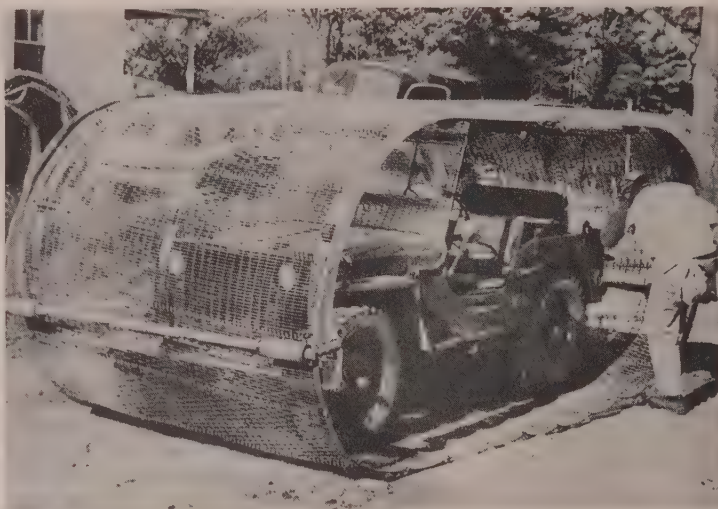
Demag was originally scheduled for dismantling, but the British and other Western Europeans agreed to leave this plant intact. Dismantlings in other instances have also been dropped; as a result the industrial outlook for the area is better than it has been in some time. Also contributing to optimism is the rising hope that the Allies will permit foreign capital investments in the Ruhr.

Still another deal involving foreign participation which is being watched with interest is an arrangement whereby Dutch and British firms will co-operate with a steelmaker at Lubeck on the Baltic sea. The Dutch will supply ore, the British coal and Lubeck will make pig iron to be shipped to Holland and Britain. The Germans are interested because production of pig iron will create welcome byproducts, electricity and gas.

## Netherlands

ROYAL Dutch Steelworks plans to build a fourth blast furnace at its Ymuiden works. Dutch exports of pig





**"SQUIRREL CAGE":** For driving over swamps, pot holes, bogs, soft beaches and heavy underbrush, the Marines have developed a "squirrel cage" for their jeeps. A circle of road matting runs under the wheels of the vehicles and back over the top, providing a portable road surface for the jeep wherever it goes. NEA photo

iron during the first 11 months of last year amounted to 263,775 tons, of which 40,000 tons went to the U. S. Switzerland, Belgium, Luxembourg and Sweden got the rest.

## Export Trade Hampered

**Import controls imposed by many foreign countries late in 1947 continue in effect**

INTERNATIONAL trade continues hampered by import controls imposed by many foreign countries toward the end of 1947, according to the Department of Commerce.

Basic conditions which led to general tightening of foreign controls have not materially improved during the past year although they are being eased somewhat by the Marshall Plan, Henry Chalmers, the department's consultant on Commercial Policy, points out. These controls are being applied with particular severity to certain U. S. imports.

**Alleviates Dollar Shortage** — The new grants and loans extended to countries of western Europe under the Marshall Plan are alleviating considerably the dollar shortage of the directly participating countries, Mr. Chalmers says. "In varying degree, they have also been easing the financial position of Canada and certain other areas where the European countries have been procuring various products authorized under this program.

"But for this action the curtailment of foreign markets that was experienced during the past year by producers of many classes of comparatively non-essential goods would have been more severe, and would probably have extended to various essential products which the importing countries could not have paid for."

Most European countries and certain Latin American republics, because of the shrinkage in their resources with which to cover the cost of any excess of imports over exports, and the continued inconverti-

bility of the majority of foreign currencies, have been making strenuous efforts to balance their trade with each other, and to avoid export surpluses to those countries which cannot supply desired products of equivalent value in return.

**Improvement Promised** — For the longer run, several recent developments carry promise for improvement of the economic positions of certain countries and for relaxation of their restrictive import controls. The three chief ones are:

1. The United States undertaking to bolster the economies of the western European countries during the next four years, while they work out basic programs for economic recovery through self help and mutual aid.

2. The new trade control measures of Canada and certain Latin American countries, which are operating to check the deterioration of their financial positions, and to bring their import programs more nearly in line with their financial limitations.

3. The broad range of tariff concessions provisionally put into effect by 22 of the 23 countries which participated in trade negotiations at Geneva in 1947, even though in most cases the benefits will not be fully realized until conditions allow relaxation of present import license and exchange regulations.

Other factors in international trade during 1948 include: Diversion of purchases to non-dollar sources, the handicap of unstable currencies, pressure for bilateral trade balancing, correcting trade deficits through currency manipulation, and stimulation of exports and of tourism.

## Foreign Surplus Nearly Gone

NEARLY 99 per cent of a gigantic foreign surplus inventory whose acquisition cost exceeded \$10 billion has been disposed of for a realization of \$1.8 billion by the Office of the Foreign Liquidation Commissioner, Department of State.

Remaining inventories have been reduced to \$116 million, of which more than \$22 million remains in Europe, nearly \$72 million in the Pacific ocean area and the Far East and the rest in Canada, the North Atlantic region and Latin America.

France purchased foreign surplus with an original cost price of \$1,398,000,000 for \$300 million. The Philippines purchased surplus with a cost price of \$1 billion for \$137 million. China, India and the United Kingdom were the next largest purchasers, in that order. The Foreign Liquidation Office is now closing out its activities, which will be finally terminated in most areas by March 31.

## U.S. IRON, STEEL IMPORTS

January to October, 1948

	Net tons	Value
Iron ore .....	5,700,592	\$23,113,926
Sponge iron .....	2,419	276,456
Pig iron .....	668,565	9,045,214
Scrap .....	268,005	7,098,169
Steel bars:		
Reinforcing .....	127	19,559
Solid or hollow .....	2,243	328,814
Other bars .....	40	9,044
Bar iron .....	90	16,969
Wire rods .....	5,091	801,053
Boiler and other		
plates and sheets .....	13,894	1,204,066
Steel ingots .....	12,601	636,985
Billets .....	292	26,174
Die blocks or blanks .....	27	14,303
Circular saw plates .....	4	3,090
Sheets, common .....	4,320	673,404
Other sheets, plates .....	1,349	173,652
Structurals .....	18,403	2,027,604
Rails, braces, etc. ....	6,232	297,287
Cast pipe .....	1,280	220,868
Pipes, tubes .....	2,500	283,358
Wire manufactures:		
Round wire .....	24	13,421
Telegraph etc. ....	5	2,242
Flat .....	1,746	1,598,437
Wire rope, strand .....	260	100,053
Other wire .....		61,406
Baling hoops, bands .....	139	15,015
Hoop, band or scroll .....	91	19,418
Nails .....	1,771	391,898



# Huge Steelmaking Capacity

**Requires tremendous quantities of raw materials to support operations at peak level**

WITH its present record high ingot capacity, the steel industry faces the task of assembling larger quantities of raw materials than ever before, including nearly 250 tons of iron ore and 203 tons of coal every minute of the night and day, the American Iron & Steel Institute reports. Large quantities of other materials will be needed, also.

The capacity of the industry at 96,120,930 tons of raw steel a year, equal to 180 tons every minute, is greater than ever before and further large expansion is planned during the next two years.

**Metallics Needed**—The metallics to produce so much steel must come mainly from two sources—iron made in blast furnaces and steel scrap. About 130 million net tons of iron ore and more than 50 million tons of scrap will be required a year. Most of the scrap will be yielded by the mills in their own operations, but a minimum of 18 million tons of purchased scrap will be needed.

About 1,546,000 tons of manganese ore, 634,000 tons of chrome ore and 144,000 tons of metallic nickel will be required for steelmaking this year. For these three materials, the United States has been largely dependent upon imports. About 90 per cent of this country's total requirements of manganese ore is normally brought from foreign countries, some of them far distant. Russia, Africa, India and Brazil are the chief suppliers. Shipments from Russia in recent years have totaled about one-fourth of the ore consumed in this country.

**Coal Requirements Huge**—The coal equivalent of the oil and gas used will be 16 million tons per year. That, however, pales before the 94 million tons of coal required to supply blast furnace coke, and the estimated 17,500,000 tons for other purposes—a total of 111,500,000 tons of coal per year to produce 96 million tons of steel ingots and 70 million tons of pig iron and ferroalloys. Most of that pig is used in steelmaking.

Steel companies now have plans to increase their combined annual capacity to more than 98,800,000 tons, adding about 2,183,000 tons in 1949 and 540,000 tons in 1950.

The capacity of the industry to produce ingots and steel for castings has been climbing at the rate of approximately 10 million tons per decade until the decade now ending,

in which the increase is over 14 million tons. Capacity has been as follows, in net tons, on January 1 of the designated years: 1919—61,021,000; 1929—71,439,000; 1939—81,829,000; 1949—96,120,930.

## Enough Iron Ore for Century

POSSIBILITIES of adequate Lake Superior iron ore supplies for the next 100 years at the present rate of consumption (80 million tons yearly) are seen by Dr. Grover C. Dillman, president, Michigan College of Mining & Technology, Houghton, Mich., writing in a recent issue of *The Detroit*, publication of the Detroit Board of Commerce.

He bases his estimates on discrepancies in figures on taxable reserves now and 18 years ago, related to actual consumption, plus technological advances in the arts of mining and mineral dressing, and in blast furnace practice.

Latest published figures of tax commissions set a total taxable reserve in Minnesota, Michigan and Wisconsin of 1,161,000,000 tons, a 15-year life at present consumption rates. The corresponding figure of 18 years ago was 1,410,000,000 tons. Difference between the two is 249 million tons, although in the interval actual production amounts to 952 million tons. The missing 703 million tons have come from new ore bodies, extension of known deposits and improved technology.

If similar conditions prevail and shipments remain at 80 million tons a year (not at all certain), then the Superior ranges would appear to have a life of about 45 years. This is being greatly extended by better methods of beneficiating lower-grade ores.

**Restudying Reserves** — Dr. Dill-

man points out the U. S. Geological Survey, in co-operation with state geological surveys, is restudying some of the lesser known areas in the iron ranges, employing modern ore-hunting methods, including the air-borne magnetometer, developed during the war primarily for submarine detection, and the gravity meter which reveals the presence of heavy bodies which might be missed by some various other means of prospecting.

On the score of taxation, he mentions two developments encouraging to the ore industry. In Minnesota, the taconites have been given a more favorable classification; and in Michigan a remission of taxation on new reserves found has been granted for a limited period.

On the basis of ore reserves, present disposition of the steel industry which depends on Lake Superior deposits for 80 per cent of its requirements, and the centers of population and steel consumption, Dr. Dillman concludes (1) any shift of position of the steel industry will be exceedingly slow; (2) the steel industry is now well-grounded and competently managed; and (3) we are entering a period in which greater dependence will have to be placed on lower-grade domestic ores.

## Magnesium Men Meet Apr. 19-20

MAGNESIUM Association's annual spring meeting, originally scheduled for May 23-24, will be held Apr. 19-20 at the Edgewater Beach Hotel, Chicago.

There will be eight technical sessions during this gathering, and talks and papers will be presented covering the various phases of the magnesium industry.

## Calendar of Meetings

Feb. 21-22, **Purdue University and Material Handling Institute:** Materials handling conference on Purdue campus at Lafayette, Ind.

Feb. 21-23, **Conference of American Small Business Organizations:** Tenth national session, Wardman Park Hotel, Washington. Group's headquarters are at 407 S. Dearborn St., Chicago.

Feb. 28-Mar. 4, **American Society for Testing Materials:** Spring meeting and committee week, Edgewater Beach Hotel, Chicago. Society headquarters are at 1916 Race St., Philadelphia.

Mar. 3-5, **American Society of Training Directors:** Fifth annual conference, Hotel Carter, Cleveland. Society headquarters are at 705 Fidelity Bldg., Cleveland.

Mar. 10-12, **American Society of Tool Engineers:** Seventeenth annual meeting, Hotel William Penn, Pittsburgh. Society headquarters are at 1686 Penobscot Bldg., Detroit.

Mar. 11-12, **Ohio Regional Foundry Conference:** Second conference, to be held on Ohio State University campus.

Mar. 14-17, **Chicago Technical Societies Coun-**

cil: Seventh Chicago production show. Show manager is Edward C. Bowman, 8 S. Michigan Ave., Chicago.

Mar. 22-23, **Export Managers Club of New York Inc.:** Meeting, Hotel Statler, New York. Club headquarters are at 2 Lafayette St., New York.

Mar. 28-Apr. 1, **American Chemical Society:** 115th national meeting, on sour crude oil, San Francisco.

Mar. 30-Apr. 1, **American Iron & Steel Institute:** Meeting of chairmen and presidents of company members, The Greenbrier, White Sulphur Springs, W. Va.

Mar. 30-Apr. 1, **Institute of Metals:** Annual general meeting at Institution of Mechanical Engineers, London.

Apr. 5-6, **Metal Powder Association:** Fifth annual meeting and exhibit, Drake Hotel, Chicago. Association headquarters are at 420 Lexington Ave., New York.

Apr. 6, **Detroit Chapter of American Foundrymen's Society:** Congress of foundry experience, Rackham Memorial Bldg., Detroit. Jess Toth, Harry W. Dietert Co., is committee chairman for event.



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**BUMPERS • GRILLES • HOODS  
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**STEEL**



## Ford's administrative organization gets another reshuffling, latest change being another step in company's decentralization plan. Top-level organizational chart released

### DETROIT

ADMINISTRATIVE organization of the Ford Motor Co. was given another reshuffling last week, hard on the heels of the establishment of the Ford International Co. and the appointment of Irving Duffy as director of purchases.

Latest change, described as another step in the company's decentralization plan, moves Lewis D. Crusoe, who has been vice president-finance and a key figure in working out more efficient planning and control procedures, to the post of vice president and general manager of a newly created Ford Division on the same level as five other operational divisions, namely, Lincoln-Mercury, Ford International, General Production, Parts and Equipment Manufacturing, and Machining & Forging. Pending the selection of a successor to the finance post, Mr. Crusoe will occupy both jobs.

**Organizational Chart**—In connection with the move the company has released the first top-level organizational chart in its history. Flow of authority descends from stockholders (the Ford family) to board of directors, to executive committee, to president, Henry Ford II, to executive vice president, E. R. Breech. At this point the chart expands to the staff vice presidents, six in number, and in charge of industrial relations, engineering, manufacturing (with which is consolidated purchasing for the time being), general counsel, sales and advertising, and finance.

Tributary flow under the executive vice president comes from the policy committee and director of public relations. Eventually, it seems certain there will be a vice president in charge of purchasing activity.

From the staff line, responsibility flows to the six operating divisions noted above. Of them, the Machining & Forging Division is relatively new and centers around the Canton, O., forging plant and the Mound Rd. machining facility here in Detroit, under direction of John Dykstra.

Under Mr. Crusoe's direction in the Ford Division are managers of sales, parts and accessories, manufacturing, industrial relations and controller, the

latter two yet to be named. All Ford regional and district sales offices, parts depots and assembly plants will come under their supervision.

**Many Former G-M Men**—Interest is the fact that of the 19 executives manning various posts on this first organizational lineup, seven are former high-placed General Motors officials, while only five can be considered old-line Ford personnel.

Mr. Crusoe joined Ford in July, 1946, as a vice president and, prior

### Automobile Production

#### Passenger Cars and Trucks— U. S. and Canada

	1948	1947
January	422,236	366,207
February	399,471	393,636
March	519,154	443,588
April	462,323	445,138
May	359,996	404,190
June	454,401	421,466
July	489,736	400,944
August	478,186	364,958
September	437,181	444,500
October	516,814	461,536
November	495,488	417,492
December	514,337	492,819
12 mos.	5,549,323	5,056,474

#### Estimate for week ended:

	(Same week)	
	1949	1948
Jan. 29	115,512	101,044
Feb. 5	104,450	82,717
Feb. 12	109,033	83,996
Feb. 19	113,000	110,536

Ward's Automotive Reports

to that time, had served as general finance manager of Fisher Body and later assistant to Mr. Breech at Bendix Aviation Corp. He is regarded as an expert in budgetary and cost control functions and will be a kingpin in future operations of the Ford Division, even more so than the past two and a half years. The new setup will relieve staff vice presidents of many detailed operating problems, permitting them to concentrate on staff duties such as formulating plans

and objectives, establishing policies and developing company-wide practices and procedure.

Destined eventually to be assigned a ranking executive post at Ford is the youngest of the three sons of the late Edsel Ford—William Clay Ford. A Yale graduate, he has started an "apprentice" course with the company, and will spend time in most sales and operating departments to acquaint himself with their functions before occupying his eventual niche. It would not surprise many to see him finally established in general purchasing activity. His brother, Benson, now heads the Lincoln-Mercury Division.

### Production Tops Estimates

DELAYS in year-end totaling of the 1948 records of United States car manufacturers, along with a lag in Canadian figures, has prevented announcement of final production figures for the year. They are now at hand and are better than earlier estimates had indicated. Total output of cars, trucks and busses, United States and Canada, aggregated 5,549,323, a 9.95 per cent increase over 1947. The United States total was 5,285,425, which, less 5542 exports to Canada and 430,675 other exports, left a net market of 4,849,208. Canadian total was 269,440, of which 54,733 were exported, leaving a Dominion market of 214,707. The United States total fell only 73,000 short of the all-time high of 1929, although trucks far eclipsed the total of 19 years previous.

March was the high production month of the year, at 519,154, followed closely by December and October, both above the half-million mark. Low for the year was May, at 359,996, primarily because of the Ford shutdown for model change. For some reason, probably because supply had caught up with demand, assemblies of motor coaches last year fell off sharply from 1947, with 12,299 built against 19,110 the year before. Coach production is still at low ebb, Ford for example having produced none since last October. December total was only 854.

### UAW To Observe Wage Bargain

ACTION of a Fisher Body UAW-CIO Local in Cleveland in urging negotiations to abrogate terms of the two-year wage contract with General Mo-

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**SHOW CASE:** Created especially for display purposes, this truck with a plexi-glass body on a Chevrolet forward-control cutaway chassis is a sensation at automotive shows

tors, so that impending wage cuts Mar. 1 might be forestalled, was not even dignified by a reply from UAW headquarters here. There was a suggestion the technique smacked of left-wing elements in the union, opposed to the leadership of Walter P. Reuther, since the proposal was said to have appeared originally in a Communist newspaper.

The UAW is planning a series of conferences with various locals throughout the industry, in which the binding terms of contracts will be emphasized. However, as could have been expected, the prospects of a 3-cent decline in hourly wage rates of General Motors employees, in the event of a drop of 3.42 points in the Bureau of Labor Statistics cost-of-living index for Jan. 15, to be announced shortly, are disturbing to other unions which have been talking fourth-round wage increases. Should the index drop more than the above figure, an even larger slice in wage rates might be required, but in no event more than 5 cents an hour. So what the average workman stands to lose is roughly the equivalent of one bottle of beer a day. On May 29, an automatic 3-cent increase is in store, although this might be canceled out by further declines in the index.

## Reselling American System

SINCE last September the Employers Association of Detroit has been sponsoring a series of weekly broadcasts under the title "Mark Adams Reporting," in which the effort has been made to resell the American system or free enterprise and to reverse the trend toward socialistic and collectivist thinking so prevalent in many quarters. The first series of 13 pro-

grams on radio station WWJ has been completed and a second group launched. Some typical subjects covered include: Assistance provided by employers to ambitious employees who wish additional training; dramatization of individual opportunity—aimed at high-school students; a drama directed at unskilled labor, pointing out where there is a definite place in the economy for these persons; discussion of business profits; importance of private ownership and incentive; an explanation of what free enterprise means to the average person.

A 600-call telephone survey made in November showed 25 per cent of the radios operating tuned to the program, a rating considered to compare favorably with leading programs, and led to the determination to continue the broadcasts. Supported by contributions from employers the project is one of the few originated in local areas where businessmen have determined to make a sincere effort to get across to the general public in an entertaining way the true story of business and industry. It is a plan worthy of consideration by other groups, since spokesmen for business are often far too inarticulate with working people for their own good.

## Kaiser Announces New Model

TO BE announced this week is the first really new model to be developed by Kaiser-Frazer Corp. since its inception, an entirely new body type known as the Kaiser Virginian. Essentially it is a sports model with the lines of a convertible but with a fixed, all-steel top having outer covering of padding and vinyl-nylon

fabric. The concealed steel roof is stamped with ridges to simulate the roof bows and the rakish lines of the convertible. Windshield posts are narrower than on sedans, while center door pillars are of chrome-trimmed safety glass. Rear window is 17 inches deep and stretches a full 73 inches in width, providing exceptional vision rearward. A distinctive wide chrome strip extends along the body sill and across rear fender skirts.

## Ferguson Shows Profit

HARRY FERGUSON Inc., Detroit, finished the year ended Dec. 31, 1948, with a profit of \$540,968 despite the fact that the recently formed company didn't begin production of tractors until last Oct. 11.

Ferguson broke ground Feb. 13 for a new plant which was completed in 116 working days. By the end of December production had reached the rate of 100 tractors a day. On Jan. 8, 1948, Ferguson had filed suit against Ford Motor Co., Dearborn Motors and others for \$251.1 million, charging patent infringement and conspiracy to destroy the Ferguson company.

## New Delivery Truck Line for Reo

REO Motors Inc., Lansing, Mich., is introducing a new line of delivery trucks with bodies to be furnished by Boyertown Body Works Inc., Boyertown, Pa. The bodies will be mounted on the new Reo chassis and will be of two styles.

## Steel Lack Hits Nash Assemblies

NASH-Kelvinator Corp. is operating its auto assembly plant at El Segundo, Calif., at less than 50 per cent of capacity until more steel is available, according to R. A. De Vlieg, vice president in charge of manufacturing.

"The new year finds Nash management wrestling with serious problems of increased manufacturing costs and steel shortages which have limited all production on passenger cars," he said.

## Parts Shortage Crimps Hudson

HUDSON Motor Car Co. suspended car assemblies briefly last week because of a shortage of parts.

About 12,000 of the company's 28,000 working force were affected by the layoff which ended last Thursday. The suspension was the fourth this year. A Jan. 21, one-day stoppage was caused by lack of frames. Two other one-day halts, on Jan. 28 and Feb. 8, were due to a shortage of engines.



# CECO-DROP



**The CECO-DROP  
forges more minutes  
per hour,  
makes more forgings  
with fewer blows,  
is safer and easier to  
operate,  
costs less to operate.**



CHAMBERSBURG ENGINEERING CO.

**CHAMBERSBURG**  
Builders of **IMPACT** Machinery

CHAMBERSBURG, PENNA.



## Bliss Replacement Parts

Program utilizes auto industry techniques stressing big inventories, quick deliveries

E. W. BLISS Co.'s newly established replacement parts program is utilizing the auto industry's parts techniques which emphasize complete inventories and quick deliveries.

About 70 per cent of the replacement parts needed for Bliss-built presses are carried in finished inventory or rough stock. In emergency, finished inventory items can be delivered in 24 hours. The remaining 30 per cent, mainly parts for obsolete equipment or for special machinery, can be provided within a reasonable time.

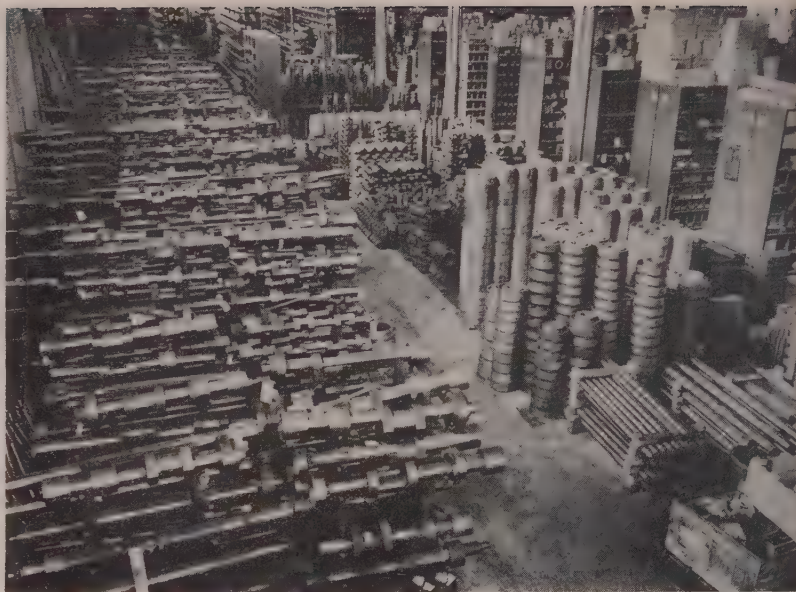
Users of the 200,000 Bliss-built presses in operation today which bear the trademarks of Bliss, Toledo, Consolidated, Marquette, Stiles and Cleveland are serviced from two parts distribution points centralized in Toledo, O., and Hastings, Mich. During the past 90 days, shipments of replacement parts have exceeded monthly 1947 averages, and even greater improvement is expected. Enlarged facilities, concentration of engineering records and a substantially increased investment in inventories made the program possible.

A. A. Frank, recently service manager and comptroller of Tucker Corp. and, for 17 years prior, assistant general manager of Chrysler Corp.'s Parts Division, has been named Bliss parts manager in charge of the project.

## Industrial Video Output Begun

REMINGTON Rand Inc., New York, has begun commercial production of Vericon, a portable television system. It compares with broadcast television as a public address system compares with broadcast radio. All impulses are carried by coaxial cable; no FCC permit is required.

Vericon's basic system includes a camera, a power unit and a viewer. It needs only to be plugged into a 110v, 60 cycle socket to be put into action. The system is designed for industry in performing or viewing hazardous operations, in remote instrument reading or in integrating time and motion study with machine operations. It may also be used in research for remote testing of jet and rocket motors, in safety observation for nuclear research, in chemical and explosive observation and in robot aircraft testing. The system has educational uses for industry in group



*Standard inclinable press parts valued at more than \$1 million are kept in storage at this Hastings, Mich., plant of E. W. Bliss Co. This represents one phase of the program which has been established to service the 200,000 Bliss-built presses in the field*

training where it is not practical to have large groups of people at the scene of the actual operation.

Remington also points out that Vericon can be used by business in identifying checks and documents, instantaneous transmission of important recorded information, remote signing of agreements and underwater salvage and diving operations.

Development of industrial television was begun in 1940 at Remington Rand's Middletown, Conn., laboratory. During the war years it was under military security and was used in guiding aircraft, ships and missiles.

## Lebanon Expands for Jet Castings

LEBANON Steel Foundry, Lebanon, Pa., has completed a \$500,000 expansion which doubles its steel casting facilities and provides for production of super-alloy castings by the Centri-Die process as developed by Firth-Vickers Stainless Steels Ltd., Sheffield, England.

As exclusive American licensee of Firth-Vickers, Lebanon is using the process, which casts centrifugally in permanent molds, in the production of jet engine castings (STEEL, Sept. 13, p. 73). Adaptations for other military and industrial requirements are under way.

The new plant comprises a 22,400-square foot addition to Lebanon's existing unit. Two five-ton overhead traveling cranes are in operation in the new building and extend into

the original plant. Two additional electric induction furnaces have been installed, and two rotary cold saws and five new centrifugal casting machines have been added to round out the specialized equipment.

## IT & T To Enter Television Field

INTERNATIONAL Telephone & Telegraph Corp. plans to enter the television receiver field, and negotiations are pending for acquisition of Farnsworth Television & Radio Corp. on the basis of one share of IT & T stock for each 1½ shares of the 1,680,568 Farnsworth shares outstanding.

Pending consummation of the deal, IT & T will make a \$1 million secured advance to Farnsworth to enable that company to pay certain of its obligations and to replenish its working capital.

## Midland Postpones Expansion

MIDLAND Steel Products Co., Cleveland, is holding up a multi-million dollar expansion program until the business outlook clarifies and the basing point controversy is settled.

"We hear so much about business recession and layoffs," said E. J. Kulas, Midland president, "that we do not feel like jumping into a major program."

Outcome of the basing point debate would be the determining factor in locating the new expansion, Mr. Kulas indicated.



# Briefs . . . .

## Paragraph mentions of developments of interest and significance within the metalworking industry

**Mine Safety Appliances Co.** will build a research laboratory in Pittsburgh devoted exclusively to the development of safety equipment for mines, industry and public service organizations. Completion is scheduled for September.

**Budd Co.**, Philadelphia, has added a new assembly line to the five already in operation at its Red Lion plant. It is fitted with a double rail to accommodate different truck gages.

**Standard Locknut & Lockwasher Inc.** has moved to new and larger quarters at 118 W. St. Clair St., Indianapolis.

**Republic Supply Co. of California**, jobber and manufacturer of industrial and oil well supplies, has opened a \$1,250,000 office and main warehouse at Eastland and Sheila street, Los Angeles.

**Department of the Army** has effected savings of \$3,355,713 during the past year through adoption of 16,055 suggestions of civilian employees.

**Ironton Fire Brick Co.**, Ironton, O., has begun work on an additional unit to increase production of refractory products for the steel industry.

**New England Council** has appointed a special committee on iron and steel supplies for New England, headed by Frederic S. Blackall Jr., president of Taft-Peirce Mfg. Co., Woonsocket, R. I.

**Bureau of Mines and Alabama Power Co.** will this week fire a coal bed at Gorgas, Ala., to begin their second co-operative experiment in underground coal gasification. The first experiment, while promising, showed that gasification should be maintained at much deeper levels, and this new experiment will be carried out at a depth of 80 to 125 feet.

**McAlear Mfg. Co.**, Chicago, producer of automatic control equipment for steam, water, oil, gas and air, has appointed Sheffler-Gross Co., Philadelphia, as sales representative in the Philadelphia territory.

**Ward Leonard Electric Co.**, Mt. Vernon, N. Y., manufacturer of electric

controls, has opened a Los Angeles branch office and warehouse at 420 S. San Pedro St. H. S. Eales is district manager.

**War Assets Administration** has leased a portion of an aircraft parts plant in Chula Vista, Calif., for five years to its wartime operator, Rohr Aircraft Corp., Chula Vista, which will produce military equipment for the Air Force.

**General Electric Co.**, Schenectady, N. Y., reports its apparatus department has opened an expanded service shop in Seattle.

**National Founders Association**, Chicago, has changed its name to National Foundry Association to identify more properly its activities on behalf of the castings industry.

### REPORTS AVAILABLE

**INDUSTRY** division of the Bureau of Census, Washington 25, D. C., has prepared a list of the pamphlets and volumes of the 1947 Census of Manufacturers which is now available. Requests for the list should be addressed to the bureau. Comparable figures have not been published since 1939.

**Landers, Frary & Clark**, New Britain, Conn., manufacturer of household electrical appliances, has appointed Colen-Gruhn Co. Inc., New York, as a distributor for metropolitan New York area.

**Dreifus Steel Corp.**, Philadelphia, steel distributor, has taken over the steel export division of Charles Dreifus Co., of which it is a wholly-owned subsidiary. Change was made to separate the steel business from the iron and steel scrap brokerage activities of Charles Dreifus Co.

**Tenney Engineering Inc.**, manufacturer of air conditioning and refrigeration apparatus, with main office and two plants in Newark, N. J., has acquired Lul Products Inc.-U.S.A., Baltimore, which makes commercial refrigeration coil parts. One of the Newark plants is to be moved immediately to Baltimore and merged with the Lul plant. The second Newark unit may

be moved to Baltimore later. Edward Barger, Lul president, becomes vice president of the Newark firm.

**Machine Division** of Standard Pattern Works, Detroit, has been organized and is now operating at 13781 Concord Ave. to rebuild, repair or retool molding machines and metalworking equipment. C. H. Miller is president of the division which offers service on any type machine.

**Westinghouse Electric Corp.**, Pittsburgh, has begun production at its Sunnyvale, Calif., plant of electric water heaters. Output of 60 units daily is planned.

**Proctor Electric Co.**, Philadelphia, manufacturer of automatic household appliances, has acquired 50,000 sq ft of space in a building on Pistorio road, Baltimore, and will establish a branch plant.

**Willard Storage Battery Co.**, Cleveland, has honored 410 employees who have served the company 25 years or more.

**Department of the Interior** is offering to rent about 200 warehouse and factory buildings on the Crab Orchard National Wildlife Refuge, Williamson county in southern Illinois. Facilities were operated during the war as the Illinois Ordnance Plant.

**Hyster Co.**, Portland, Oreg., has named McCall-Boykin Co. Inc., Baltimore, as distributor of lift and straddle trucks and mobile cranes in the Baltimore vicinity.

**R-S Products Corp.**, Philadelphia, has appointed Trident Engineering Co., San Francisco, as a sales representative for its Valve Division.

**Eagle Lock Co.**, Terryville, Conn., has acquired Bell Lock Co., Michigan City, Ind., and will transfer production of the latter to Terryville. Operating as a division of Eagle, the new division will specialize in the manufacture of locks for the vending machine industry.

**Schaible Co.**, Cincinnati, has acquired D. T. Williams Valve Co., Cincinnati, manufacturer of high-pressure valves. Purchasing firm has plants in Trenton, O., and Pasadena, Calif., on production of low-pressure valves, heating and plumbing equipment. R. E. Mullane, most recent Williams president, will be a director under the new set-up and will continue in sales work.



# The Business Trend

ALTHOUGH industrial production is currently below the high levels attained in the last quarter of 1948, it is being maintained on a high plateau above the year ago levels. STEEL's industrial production index for the week ended Feb. 12 was 170 per cent (preliminary) of the 1936-1939 average, one point higher than the preceding week and 13 points higher than a year ago.

**STEEL**—Soft spots in various segments of the metal-working industry have had little effect on the steel industry to date. Production of steel for ingots and castings was at 100 per cent of capacity in the week ended Feb. 12, unchanged from the preceding week. The steel industry's output of ingots and castings exceeded 8 million tons a month for the first time in history during January and is continuing at the same pace this month. The January total of 8,172,236 net tons was an increase of 401,00 tons over December and nearly 700,000 tons over January, 1948.

**AUTOMOBILES**—Outturn of passenger cars and trucks climbed more than 6000 units in the week ended Feb. 12 as assembly lines for new models picked up speed. The total for the week was 109,033 units as compared with the revised total of 102,981 in the preceding week.

**COAL**—Stocks of bituminous coal on Jan. 1 were estimated by the Bureau of Mines to be about 69.4 million net tons, only 0.3 per cent below the postwar peak reached on Dec. 1. Despite the fact the aggregate of bituminous coal produced in 1948 was con-

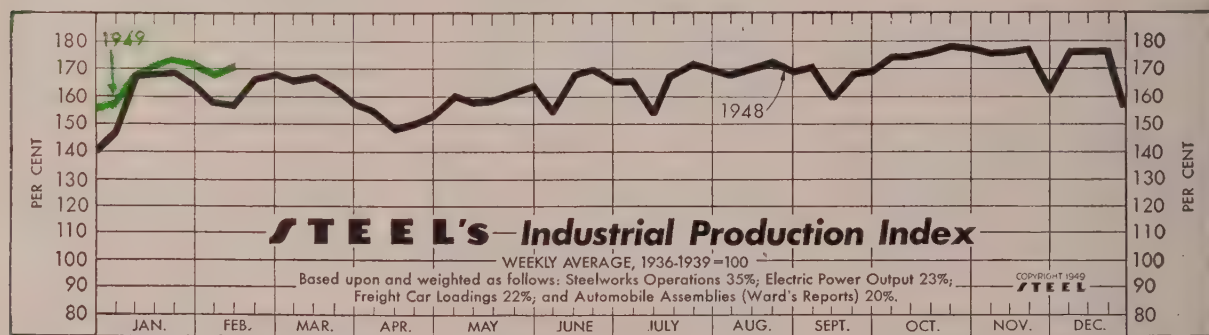
siderably below 1947, stocks on hand Jan. 1 were 33 per cent higher than they were a year earlier.

**CONSTRUCTION**—Contracts awarded for building and heavy engineering projects in the 37 states east of the Rockies in January totaled about \$483 million, a decline of 31 per cent from December and 22 per cent lower than in January of last year. The decline was especially pronounced in residential and heavy engineering awards which dropped 38 and 40 per cent respectively, from December totals.

**INCOME**—Personal income rose in December to an annual rate of \$220.8 billion, bringing the full year total of personal income to \$214 billion, according to the Department of Commerce. The 1948 total was \$18 billion above the level of the preceding year.

**INVENTORIES**—Total business inventories at the end of December were \$54 billion, off \$1.4 billion from the end of November. The Commerce Department reports this decline was somewhat larger than the usual yearend decrease in business inventories. Manufacturers' inventories, however, rose almost \$600 million while wholesalers' stocks were off about \$200 million and retailers' holdings fell \$1.7 billion.

**PRICES**—Weekly wholesale price index of the Bureau of Labor Statistics declined 1.2 per cent in the week ended Feb. 8, following two weeks in which the index had remained firm. Index for the latest week is 156.9 per cent of the 1926 average, 2.2 per cent below the level of four weeks ago and 2.5 per cent below the like 1948 week.



Index (chart above): Week ended Feb. 12 (preliminary) 170 Previous Week 169 Month Ago 171 Year Ago 157

## BAROMETERS of BUSINESS

### INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	100.0	100.0	99.0	93.0
Electric Power Distributed (million kilowatt hours)	5,722	5,778	5,727	5,385
Bituminous Coal Production (daily av.—1000 tons)	1,892	1,743	1,914	1,892
Petroleum Production (daily av.—1000 bbl)	5,330	5,389	5,428	5,385
Construction Volume (ENR—Unit \$1,000,000)	\$131.2	\$209.7	\$132.6	\$133.5
Automobile and Truck Output (Ward's—number units)	109,033	102,981	112,587	83,996

\*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.

### TRADE

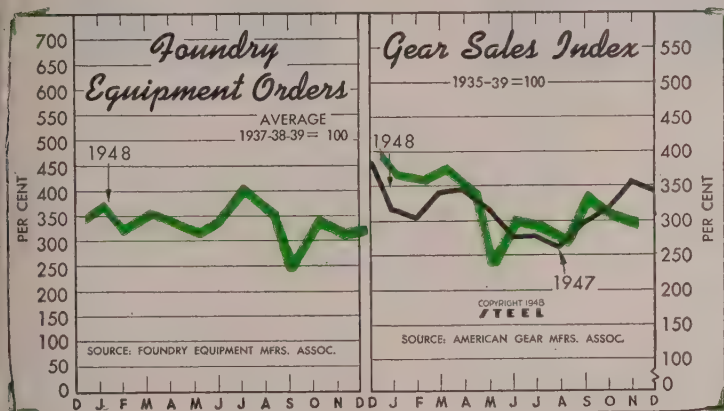
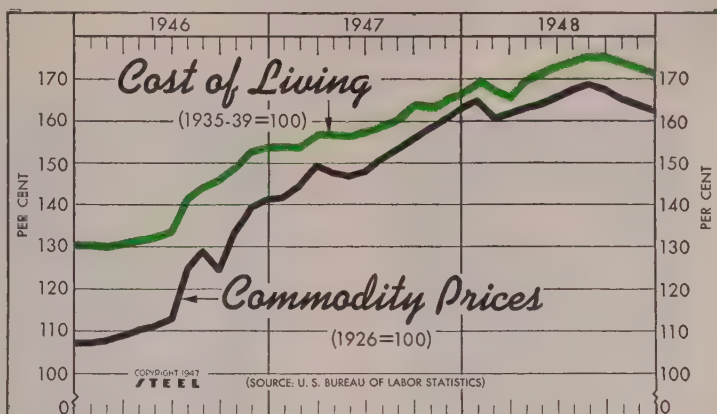
Freight Carloadings (unit—1000 cars)	678†	682	733	734
Business Failures (Dun & Bradstreet, number)	137†	145	127	128
Money in Circulation (in millions of dollars)‡	\$27,557	\$27,556	\$27,919	\$28,189
Department Store Sales (changes from like wk. a yr. ago)	-4%	-7%	+8%	+9%

†Preliminary. ‡Federal Reserve Board.



# Wholesale Commodity Price— Cost of Living Indexes

	—Commodities— (1926=100)			—Living Cost— (1935-39=100)		
	1948	1947	1946	1948	1947	1946
Jan.	165.7	141.5	107.1	168.8	153.3	129.9
Feb.	160.8	144.5	107.7	167.5	153.2	129.6
Mar.	161.4	149.5	108.9	166.9	156.3	130.2
Apr.	162.7	147.7	110.2	169.3	156.2	131.1
May	163.9	147.1	111.0	170.5	156.0	131.7
June	166.2	148.0	112.9	171.7	157.1	133.3
July	168.7	150.8	124.7	173.7	158.4	141.2
Aug.	169.5	153.7	129.1	174.5	160.3	144.1
Sept.	168.7	157.4	124.0	174.5	163.8	145.9
Oct.	165.2	158.5	134.1	173.6	163.8	148.6
Nov.	163.9	159.6	139.7	172.2	164.9	152.2
Dec.	162.2	163.2	140.9	171.4	167.0	153.3
Ave.	164.9	151.8	120.9	171.2	159.2	139.3



	Foundry Equipment Orders*		Gear Sales	
	Index (1937-38-39=100)		Index (1935-39=100)	
	1948	1947	1948	1947
January	380.9	346.8	317.0	
February	367.3	324.4	303.0	
March	326.2	326.2	342.9	
April	412.0	320.9	346.2	
May	388.5	253.6	317.2	
June	376.8	324.1	275.0	
July	456.3	348.4	278.5	
August	324.7	335.6	261.6	
September	273.5	320.4	297.7	
October	296.0	333.3	317.7	
November	284.4	309.0	356.9	
December	243.7	325.9	343.6	

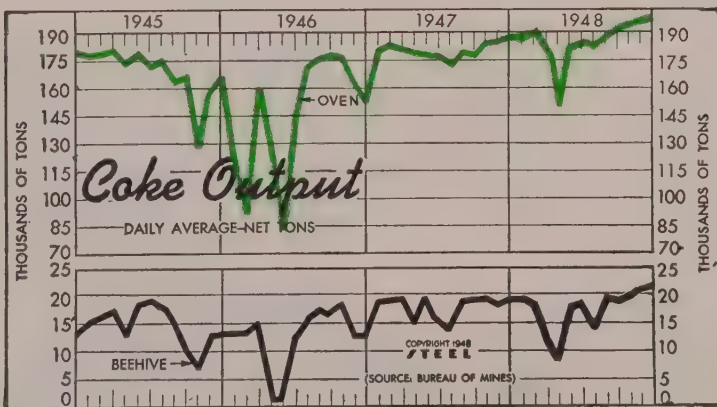
\*By foundry trades only.

## Coke Output

Bureau of Mines

(Daily Average Net Tons)

	Oven		Beehive	
	1948	1947	1948	1947
Jan.	189,191	181,245	19,588	18,819
Feb.	190,098	183,189	18,625	18,876
Mar.	182,340	182,529	10,485	19,199
Apr.	149,692	179,428	8,235	14,591
May	184,568	179,400	18,651	19,800
June	186,425	178,400	18,045	15,700
July	184,286	174,300	14,032	14,100
Aug.	188,468	181,697	19,751	18,346
Sept.	192,090	180,900	19,616	19,800
Oct.	192,440	188,200	20,083	20,200
Nov.	193,565	189,400	20,341	18,700
Dec.	195,670	191,000	20,588	19,300
Ave.	185,770	182,900	17,338	18,321



## FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	\$12,573	\$13,914	\$13,085	\$12,536
Federal Gross Debt (billions)	\$252.6	\$252.6	\$252.3	\$254.7
Bond Volume, NYSE (millions)	\$16.4	\$17.7	\$14.5	\$16.8
Stocks Sales, NYSE (thousands)	5,033	4,686	4,085	4,813
Loans and Investments (billions)†	\$62.7	\$62.9	\$62.6	\$64.9
United States Gov't. Obligations Held (millions)†	\$33,268	\$33,411	\$33,484	\$37,310

†Member banks, Federal Reserve System.

## PRICES

	Latest Period*	Prior Week	Month Ago	Year Ago
STEEL's Composite Finished Steel Price Average	\$97.77	\$97.77	\$97.77	\$78.59
STEEL's Nonferrous Metal Composite‡	232.6	232.6	232.6	189.5
All Commodities†	156.9	158.8	160.5	160.9
Metals and Metal Products†	178.3	178.3	175.3	154.8

†Bureau of Labor Statistics Index, 1926=100. ‡1936-1938=100.



# Men of Industry



LOUIS C. EDGAR JR.



RALPH M. JOHNSON



JAMES F. EDNIE

**Louis C. Edgar Jr.** has been elected president, E. W. Bliss Co., Brooklyn, N. Y., builder of stamping presses, can machinery and rolling mills. He will make his headquarters at the Toledo, O., Works. Mr. Edgar has served since 1946 as president, H. & B. American Machine Co., Pawtucket, R. I., and formerly was with the Blaw-Knox Co. as a service and design engineer, and later general manager of its Martins Ferry, O., Division.

**Miles K. Smith** has been appointed vice president and technical director of Jessop Steel Co., Washington, Pa. He formerly was with Molybdenum Corp. of America in a technical sales capacity. Prior to that Mr. Smith was employed for many years by Latrobe Electric Steel Co. in the production of tool steels.

**Quentin Graham** has been elected a vice president of Elliott Co., Jeanette, Pa. He joined Elliott in 1944 as manager of the electrical engineering department, and in 1946 was appointed manager of the Ridgway Division of the company.

**James D. Russell** has been promoted to sales manager, and **Leonard R. Shorek** to chief engineer, Young Bros. Co., Detroit.

**William A. Lampe** has been appointed vice president in charge of sales, Fitz-Simons Steel Co., with headquarters at Cleveland. **Michael J. Sullivan**, who will continue as secretary and treasurer of the company, has been placed in charge of all administrative and financial activities. Mr. Lampe has been sales representative for

FitzSimons Steel Co. in the Cleveland area for 25 years, and Mr. Sullivan has been associated with the company 21 years, and secretary and treasurer since 1942. He will make his headquarters at Youngstown.

**Ralph M. Johnson** has been appointed vice president in charge of sales by Norton Co., Worcester, Mass. He formerly was vice president and general sales manager of its Abrasive Division. Mr. Johnson is also a director of the company and of Behr-Manning Co., Troy, N. Y., a Norton affiliate.

**Robert L. Springer** has been appointed Chicago district manager for Firth Sterling Steel & Carbide Corp., McKeesport, Pa. He has been serving as assistant manager at Chicago.

**R. F. V. Stanton**, vice president in charge of manufacturing, American Machine & Foundry Co., New York, has been elected a member of the board of directors.

Star Electric Motor Co., Bloomfield, N. J., announces election of **Harris T. Shea** as president to succeed **Elvin E. Hallander**, who was elected chairman of the board of directors. Mr. Shea has been chairman of the executive committee of the board of directors.

**Andre S. Rubin Jr.** has been appointed sales manager of Marlow Pumps, Ridgewood, N. J. He has been associated with the company since 1942 when he became assistant to the late **A. S. Marlow Sr.**, founder of the firm.

**Dr. G. V. Slottman** has been appoint-

ed director of research and engineering for Air Reduction Co. Inc., New York. Since 1948 he has been technical assistant to the vice president in charge of sales.

**James F. Ednie**, formerly chief metallurgist for Duquesne Smelting Corp., Pittsburgh, is now associated with National Carbide Die Co. and subsidiary, Penn Carbide & Alloy Casting Co., McKeesport, Pa., as sales manager.

**Kempton Dunn** has been elected vice president, and **Cyrus E. Brush**, secretary of American Brake Shoe Co., New York. Mr. Dunn, elected treasurer of the company in 1942, assumed the additional duties of secretary in 1947. He continues as treasurer. Mr. Brush became assistant secretary of the company in 1947.

Anchor Tool & Die Co., Providence, R. I., formerly Sandsea Inc., announces retirement of **Harry Sandsea** as president and general manager, and the election of **Ross R. Harrison** as chairman of the board and chief executive officer of the company. Mr. Harrison formerly was president of the New England Small Arms Co.

**Frederick D. Keeler** has been made sales manager, Rolling Mills Division, Plume & Atwood Mfg. Co., Thomaston, Conn. Mr. Keeler has been in the sales department since August, and formerly was assistant sales manager, Bridgeport Rolling Mills.

Gaylord Container Corp. announces appointments of **R. S. Updyke** as general manager of the Milwaukee oper-





# "The Omaha Incident"

PROVES ANOTHER ADVANTAGE OF  
**SPEED NUTS\***  
TO GRAND HOME APPLIANCE CO.

A few months ago, Grand Home Appliance Co., Cleveland, Ohio, shipped a carload of their new Grand Gas Ranges to an Omaha distributor.

The ranges were attached to their crates with conventional nuts, bolts and washers. For test purposes, however, six of the units were secured to their crates with Tinnerman's new Crating SPEED NUTS.

As it turned out, the distributor found most of the units had been damaged in transit and he had the entire shipment returned to Cleveland. When Grand inspected the carload, they found that all but six of the ranges had vibrated loose from their crates and were extensively damaged. These six, still in perfect condition, were the units that had been tightly secured with Crating SPEED NUTS!

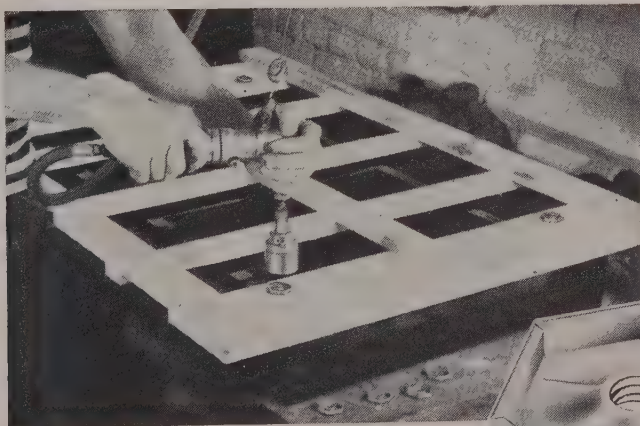
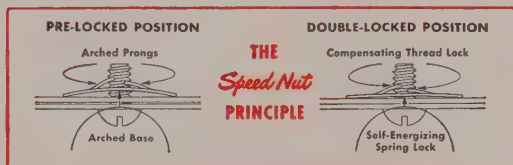
It's easy to see why Grand Home Appliance Co. is now using more and more SPEED NUTS. What

about your fastening problems? Perhaps Tinnerman can help you solve them. Send for details on our Fastening Analysis Service . . . now. Tinnerman Products, Inc., 2040 Fulton Road, Cleveland, Ohio. Sales offices in principal cities.

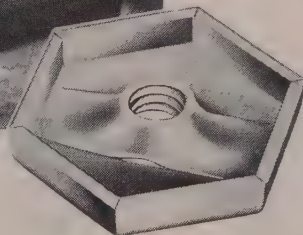
In Canada: Dominion Fasteners Limited, Hamilton

In England: Simmonds Aerocessories, Ltd., Treforest

In France: Aerocessoires Simmonds, S. A., Paris



The lower section of a Grand range, shown at left, is being secured to the crate base with four Crating SPEED NUTS. This operation requires only one quick application of power tool to part.



Revolutionary, self-locking SPEED NUT C6888. Ends shipping damage caused by vibration . . . cuts material costs . . . saves time, work and money.



**TINNERMAN**

# Speed Nuts

\*Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS



ations, and **Glenn B. Elliott** as sales manager. **Emil Fredericks** was made plant superintendent.

—o—

**Oscar Blohm**, owner, secretary and treasurer, Triangle Foundry Co., Chicago, has sold the property and has established practice as a foundry consultant on metallurgical, management and molding problems. His headquarters are at 416 S. Kenilworth Ave., Oak Park, Ill. Mr. Blohm was formerly chief metallurgist, Hills-McCanna Co., Chicago.

—o—

**Bernard A. Annis**, for the past three years foundry engineer, Lester B. Knight & Associates, Chicago, and for 18 months prior to that an engineer, Beardsley & Piper Co., Chicago, is now associated with Hydro-Blast Corp., Chicago, as foundry sales engineer.

—o—

**Desmond Stolz** has been appointed factory and production manager, Acro Welder Mfg. Co., Milwaukee.

—o—

**Dr. Enrico Volterra**, Rome, Italy, has been appointed associate professor of mechanics at Illinois Institute of Technology, Chicago.

—o—

**C. F. Safreed** is president of McNeil Machine & Engineering Co., Akron, which has purchased Cleveland Crane & Engineering Co., Wickliffe, O. The latter company will continue to operate as heretofore, with no changes in over-all management, organization or policies. **H. T. Florence** is its president.

—o—

**R. J. Waterbury**, since 1941 staff engineer on both commercial and passenger car bodies and sheet metal design for Chevrolet Motor Division, Detroit, General Motors Corp., has been appointed chief assistant engineer in charge of design, executive

and administrative engineering. **P. A. Collins**, head of Chevrolet experimental engineering since 1934, has been named chief assistant engineer in charge of production and experimental engineering.

—o—

**George L. Chedsey** has been appointed supervisor of mining equipment, Syntro Co., Homer City, Pa. **E. J. McIlvaine** has been appointed as a junior salesman in the Vibratory Material Handling Division of the St. Louis office; **John C. Mitchell** will take over power tool sales in Boston; **A. C. Staley Jr.** has been appointed junior salesman in the Vibratory Material Handling Division in Cleveland; and **F. J. Kirby Jr.** will handle power tool sales in Cleveland.

—o—

**Donald W. Graham** has been appointed district sales manager at Cincinnati for the Heavy Chemicals Division of Pennsylvania Salt Mfg. Co., Philadelphia. He succeeds **C. W. Dermitt**, resigned. Mr. Graham had been in charge of the St. Louis office, and will temporarily combine his duties at Cincinnati and St. Louis.

—o—

**Carl F. Roby** has been named a director of Cincinnati Milling Machine Co., Cincinnati, and **Swan E. Bergstrom**, sales manager for seven years, was named a vice president. Mr. Roby was managing director of Cincinnati Milling Machine Ltd., Birmingham, England, from 1934 to 1946, when he returned to the parent company as vice president.

—o—

**Henry D. Coulton** has been appointed sales manager, Eastern Direct Sales Division at Reading, Pa., for Glidden Co., Cleveland. Before joining the Navy in 1941 he served as assistant manager\* of retail stores and as assistant to the manager of industrial and transportation sales. After the

war Mr. Coulton was named assistant sales manager of the company's Nubian Division in Chicago.

—o—

**Lynn R. Strawn**, formerly of the Texas Co. at Port Arthur, Tex., has been named plant manager of the Neches, Tex., plant of Jefferson Chemical Co., which is jointly owned by the Texas Co. and American Cyanamid Co. **A. A. Triska**, former manager, has been transferred to New York as assistant manager of the production department.

—o—

**Thomas L. Moore** has been appointed salesman, Armco Steel Corp., Middletown, O., with headquarters in Baltimore. He will work out of the Philadelphia district office. Mr. Moore has been assistant manager, development engineering department, of the Rustless Division of the company at Baltimore.

—o—

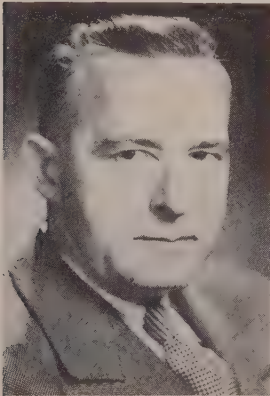
Controllers Institute of America, New York, has appointed **Cornelius Bohlen**, secretary, Converse Bridge & Steel Co., Chattanooga, Tenn., and **Walter H. Dupka**, vice president of Jones & Laughlin Steel Corp., Pittsburgh, to serve on its membership committee for the Controllorship Foundation.

—o—

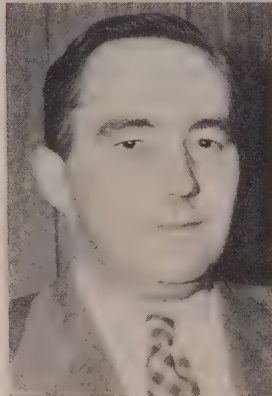
**William E. Gahl** has been appointed chief engineer, Templeton, Kenly & Co., Chicago, to succeed **F. J. Jakoubek**, resigned to enter the manufacturing business for himself.

—o—

Eagle-Picher Co., Cincinnati, announces appointment of **Clyde B. Lynde** as vice president and general manager, Insulation Division, Eagle-Picher Sales Co. For ten years he served as insulation district manager at Joplin, Mo., and head of the insulation contracting department of Eagle-Picher Co. He later resigned



C. F. SAFREED



HENRY D. COULTON



CLYDE B. LYNDE



# Plymetl

## The material that's making news today

For over twenty-five years, Plymetl — a Haskelite material — has helped designers and engineers build greater performance, durability and sales appeal into their manufactured products. Its use eliminates deadweight, and makes complicated framing members and fastenings unnecessary. There is only one Plymetl . . . Haskelite Plymetl . . . with its performance proved. A material of

many advantages, Haskelite Plymetl is easily worked with simple metalworking or woodworking tools. It can often save man-hours to a point where the final cost of the product may be noticeably reduced. The unique strength and weight characteristics of Plymetl are graphically described in the chart below. Write for complete data and samples of Plymetl.

	PLYMETL UVU			STEEL (U.S. STD. GAUGES)			ALUMINUM (U.S. STD. GAUGES)		
	1/4"	5/16"	3/8"	20 ga.	16 ga.	12 ga.	10 ga.	8 ga.	6 ga.
Weight in lbs. per sq. ft.	1.01	1.17	1.43	1.5	2.5	4.37	1.44	1.81	2.28
Stiffness factor E I in. 2 lbs.	4,900	8,400	13,200	124	575	3,050	872	1,760	3,500

	PLYMETL EVE			STEEL (U.S. STD. GAUGES)			ALUMINUM (U.S. STD. GAUGES)		
	1/4"	5/16"	3/8"	20 ga.	16 ga.	12 ga.	10 ga.	8 ga.	6 ga.
Weight in lbs. per sq. ft.	2.25	2.40	2.56	1.5	2.5	4.37	1.44	1.81	2.28
Stiffness factor E I in. 2 lbs.	17,000	28,000	43,000	124	575	3,050	872	1,760	3,500

In the chart above, note that a 5/16" EVE Plymetl panel (zinc-coated steel two sides) weighs 2.40 lbs. per square foot. This is less than the weight of 16-gauge steel. However, the resistance to bending of the Plymetl panel is about 50 times as great!

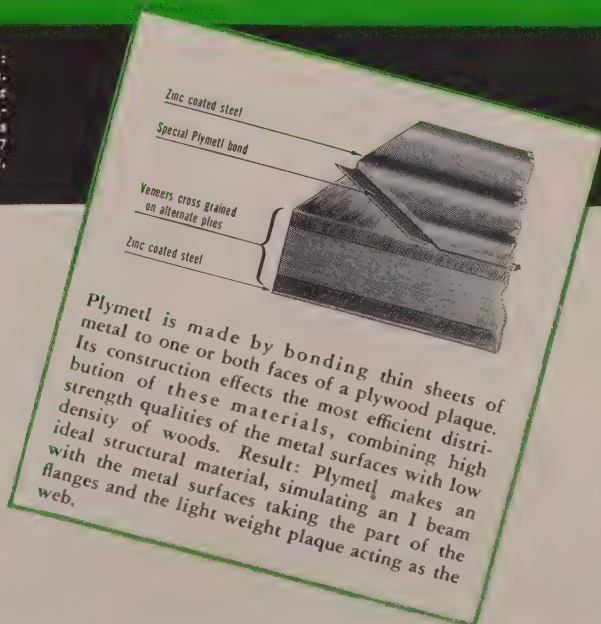
Where rigidity is of prime importance, consider the following: A 3/8" UVU Plymetl panel (aluminum two sides) weighs 1.43 lbs. per square foot. The weight of 20-gauge steel is 1.5 lbs. per square foot. The Plymetl panel, though lighter in weight has 100 times the stiffness of the sheet steel.

In computing the values of Plymetl, the following is assumed:  
 (1) The modulus of elasticity of steel, 30,000,000 lbs. per sq. in.  
 (2) The modulus of elasticity of aluminum, 10,000,000 lbs. per sq. in.  
 (3) The modulus of elasticity for the core material, 1,300,000 lbs. per sq. in. along the grain, 65,000 lbs. per sq. in. across the grain.  
 (4) The thickness of steel and aluminum, .021" (27 ga.) and .015", respectively.  
 (5) The weight of plywood plaque, 30 lbs. per cu. ft.

Write for complete data and samples.

**HASKELITE**  
**MANUFACTURING CORPORATION**  
 Dept. S, Grand Rapids 2, Mich.

New York Chicago  
 Detroit St. Louis Philadelphia Los Angeles  
 Canada: Railway & Power Engineering Corp., Ltd.



Plymetl is made by bonding thin sheets of metal to one or both faces of a plywood plaque. Its construction effects the most efficient distribution of these materials, combining high strength qualities of the metal surfaces with low density of woods. Result: Plymetl makes an ideal structural material, simulating an I beam with the metal surfaces taking the part of the flanges and the light weight plaque acting as the web.



these positions to go into the insulation contracting business for himself in an organization known as Industrial Insulators Inc., distributing and applying Eagle-Picher insulations in the Houston, Tex., area.

**J. A. Schultz** has been appointed purchasing agent, Atomic Power Division, Westinghouse Electric Corp., Pittsburgh. Appointed to positions at the company's Transformer Division at Sharon, Pa., are: **C. H. Bartlett** as manager of power transformer sales; **Robert J. Seybold** as assistant purchasing agent; and **F. E. Baker** as manager of the specialty transformer department, succeeding Mr. Bartlett in that position.

**Nels H. Fugelsang** has been named sales manager of the Sacramento, Calif., office of General Electric Supply Corp.

**James R. Beers** has been appointed assistant district manager of the Pittsburgh warehouse, United States Steel Supply Co. He has held a similar post in the Milwaukee office of the company.

**J. R. Thompson** has been named manager of flat belting, conveyor, elevator and transmission belting in the industrial products sales department, B. F. Goodrich Co., Akron, and **Paul W. Van Orden** was named manager of "V" belts and packing.

**Vernon O. Droege** has joined Youngstown Sheet & Tube Co., Youngstown, as division engineer in the industrial engineering department.

**John T. McHugh** has been appointed department superintendent of the nail mill at Donora, Pa., for the Steel & Wire Works of American Steel & Wire Co., United States Steel Corp. subsidiary.

**E. L. Phillips**, formerly assistant sales manager, Cold Metal Products Co., Youngstown, has been appointed sales manager of the company's Western Warehouse Division, serving the Pacific Coast, with headquarters at Los Angeles.

General Fireproofing Co., Youngstown, has established a branch office in Detroit, and has named **R. C. Scott** as branch manager.

**H. G. Kronenwetter**, formerly advertising production manager, Radio Division, Sylvania Electric Products Inc., New York, has been appointed



**DR. JOHN F. THOMPSON**  
Elected president, International Nickel Co. of Canada Ltd., Copper Cliff, Ont. Noted in STEEL, Feb. 14 issue, p. 76

manager, advertising production, for the Lighting Fixture, Lamp, Radio, Electronics & International Divisions of the company.

**John W. Vanderslice** has been appointed chief industrial engineer, Oliver Iron & Steel Corp., Pittsburgh. He was formerly associated with the Pittsburgh office of American Associated Consultants Inc. He has been affiliated with Jones & Laughlin Steel Corp., with Carnegie-Illinois Steel Corp. as an industrial engineer, and was production supervisor for Kaiser Steel Co., Fontana, Calif., and supervisor of industrial engineering for Lockheed Aircraft Co., Burbank, Calif. During World War II Mr. Vanderslice served as an industrial engineer with Goodyear Aircraft Co., Akron.

**Harry H. Rose** has been named general manager, Simmons Fastener Corp., Albany, N. Y. During the last two years he has been general sales manager of the company, and for three years prior was a sales engineer. Before his affiliation with the corporation, Mr. Rose was an engineer for the parent company, Simmons Machine Tool Corp.

**Lawrence Schacht**, president, Schacht Steel Construction Inc., New York, has been elected a director of National Bronx Bank of New York.

**W. C. Schade** has been appointed manager of Product Divisions, Olin Industries Inc., New York.

**M. Dickinson** has been appointed a field service engineer for Bassick Co., Bridgeport, Conn., a division of

Stewart-Warner Corp. He was with Bureau of Aeronautics of the United States Navy, where he headed development of equipment for handling and servicing of aircraft.

**C. Harold Phillips** has been appointed plant manager at Fort Wayne, Ind., for Essex Wire Corp., where he was assistant plant manager. He succeeds the late **Herman Arber**.

**Frank T. Siersma**, vice president in charge of automotive sales, Lintern Corp., Berea, O., has established headquarters in that city. He formerly was in Atlanta with Safety Tank Corp.

**Charles M. Wheeler** has been appointed general sales manager, Union Switch & Signal Co., Swissvale, Pa.

**Francis W. Vigneault Jr.** has been named district representative for tractor equipment in the northeastern territory for Hyster Co., Portland, Oreg.

**Austin J. Lease** has been appointed assistant superintendent of the cold drawn bar department at Brier Hill, Youngstown Sheet & Tube Co., Youngstown.

Inland Steel Products Co., Milwaukee, announces the appointments of **Howard Cross**, **Robert Ladewig** and **Larry Sitton** as sales representatives for the new St. Louis branch.

**Robert E. Mahaffey** has been appointed district sales manager for Apex Electrical Mfg. Co., Cleveland, in seven northeastern Ohio counties.

**Herbert M. Gould** has been appointed general manager of the Motors Holding Division, General Motors Corp., Detroit. He succeeds **Albert L. Deane**, retired.

Quaker Chemical Products Corp., Conshohocken, Pa., announces appointment of **W. J. Haring** as technical director. Associated with the company since 1944, he has served as director of metals research.

**Gilbert R. Cassidy** has become affiliated with Bushwick Iron & Steel Co. Inc., Brooklyn, N. Y., in a general sales capacity, with special attention to be directed to bolt, nut, rivet and tie rod sales.

Chain Belt Co., Milwaukee, announces opening of two new district sales offices. **Clarence R. Studer** will





EDWARD H. KELLEY

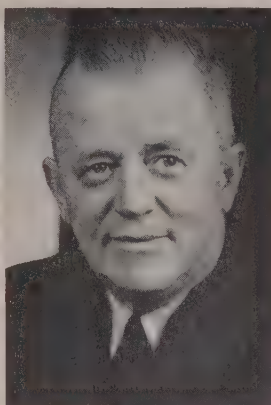
Who has been appointed chief engineer of the Chevrolet Motor Division, Detroit, General Motors Corp. Noted in STEEL, Feb. 14 issue, p. 78

be manager of the St. Louis office, and **David B. Hill**, manager of the Jacksonville, Fla., office.

—o—  
**Louis Silver**, vice president and sales manager, Garod Electronics Corp., Brooklyn, N. Y., has been appointed executive vice president and general manager. **Paul Graf** was appointed assistant vice president of production, and **Robert Leykum**, plant superintendent.

—o—  
**Edwin A. Glenn Jr.** has joined the New Holland Machine Co., New Holland, Pa., as metallurgist for the development engineering department. He has been senior metallurgist in the research department of Mack Mfg. Corp., Plainfield, N. J., and previously was with American Car & Foundry Co.

—o—  
**J. Gordon Collins** has been appointed to direct sales of new products as developed by the Pigment Division of National Lead Co., New York. He was connected with U. S. Rubber



JOHN G. WOOD

Appointed executive assistant to the general manager for engineering, Chevrolet Motor Division, Detroit, General Motors Corp. Noted in STEEL, Feb. 14 issue, p. 78

Co. for 14 years, the last eight years as sales manager of the Chemical Division, and moved to Michigan Chemical Corp. as sales manager before joining National Lead.

—o—  
**Newman L. Smith** has been elected president of Airquipment Co., Burbank, Calif., and of its wholly owned subsidiary, Aerol Co. Inc. Mr. Smith is also a director of both companies, wholly owned subsidiaries of Lockheed Aircraft Corp., and succeeds **B. W. de Guichard**, retired. **Jack Newburn**, superintendent of Lockheed's Constellation Division, was elected vice president and general manager of Airquipment.

—o—  
**I. N. Kimsey** has been named field sales manager, industrial products sales department, B. F. Goodrich Co., Akron. Formerly manager of the Akron district for industrial products sales, he is succeeded in that position by **John M. Cooney**. **Charles F. Pankey** has been named regional store manager for the Pacific Coast

division, Replacement Tire Sales Division of the company. **Everett C. Shingleton** has been named assistant product manager for automotive, industrial and farm services tire sales in the Automotive, Aviation & Government Division.

—o—  
**Austin A. Kaiser** has resigned as vice president and secretary of C. A. Roberts Co., Chicago, after 33 years' affiliation. **Charles S. Roberts** has been elected vice president, **Charles S. Cline**, secretary and treasurer, and **Clarence T. Johnson**, Chicago district sales manager.

—o—  
Globe Products Mfg. Co., Los Angeles, announces election of **W. B. Merriam** as president. He previously served as executive vice president. **R. E. Lockard** was elected vice president in charge of sales, and **Thomas O'H. McArdle**, formerly with Lynn Co., Burbank, Calif., will head the Contract Division.

—o—  
**T. W. Plante**, superintendent of blast furnaces, Jones & Laughlin Steel Corp.'s Eliza Works at Pittsburgh, has accepted a position with Pacific Steel Co. of Chile, South America, which is building an integrated steel mill near Concepcion. Mr. Plante will be superintendent in charge of blast furnace operations and raw materials.

—o—  
Penn Metal Co., Boston, has appointed **Albert A. Goodson Jr.** as its district sales manager for the Texas territory, with offices at Houston. Mr. Goodson succeeds the late **W. N. Spires**.

—o—  
**L. R. Valette**, formerly superintendent of the hot strip mill, Midland Works of Crucible Steel Co. of America, Pittsburgh, has been appointed division superintendent of hot and cold strip mills.

## OBITUARIES . . .

**Jarl S. Sprott**, 67, president, Globe-Wernicke Co., Cincinnati, died Feb. 11. He joined the firm, manufacturer of steel office equipment, in 1932 as vice president and general manager, and became president two years later.

—o—  
**John W. McLennan**, 66, chairman of the board of directors and former president of Carolina Steel & Iron Co., Greensboro, N. C., died recently following a heart attack.

—o—  
**Dr. William M. White**, 77, hydraulic

engineer and inventor, who retired in 1942 from the post of chief engineer in the hydraulic turbine department, Allis-Chalmers Mfg. Co., Milwaukee, died Feb. 9 in Miami, Fla.

—o—  
**Joseph W. Spisak**, 45, president and founder of Speedline Inc., Cleveland, specialist in the design of tools and machinery, died Feb. 13.

—o—  
**John H. Adams**, 92, a pioneer in development of iron and steel industry in Alabama, and industrialist of Birmingham, died Feb. 11. A native of Birmingham, England, Mr. Adams went to Birmingham, Ala., in 1880 as

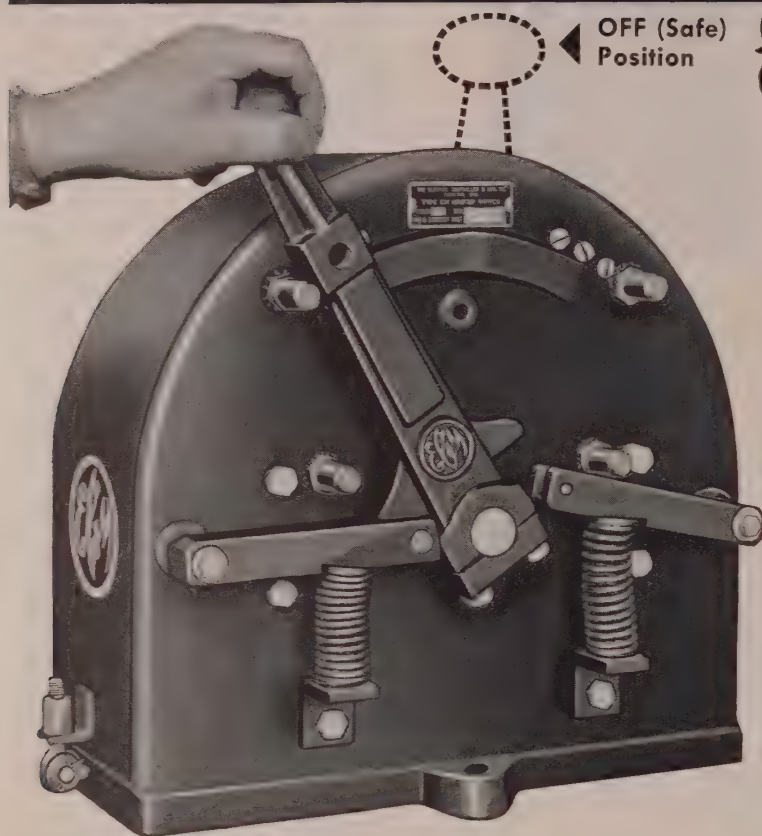
superintendent of the newly reorganized Birmingham Rolling Mill Co.

—o—  
**Cornelius W. Woodward**, 70, associated with Electric Storage Battery Co., Philadelphia, in an executive capacity before he retired in 1940, died Feb. 9.

—o—  
**H. F. Atherton**, 65, chairman of the board, Allied Chemical & Dye Corp., New York, died recently at Boca Grande, Fla., following a heart attack. He was president and chairman of the company from 1935 to 1946. In the latter year he relinquished the office of president.



# Master Switch automatically returns to Off-Position from any speed-point in either direction



OFF (Safe)  
Position

Provides Safe Operation should operator fall or otherwise remove his hand from master-handle.

There are several *speed-control* applications where *safe practice* dictates that power be automatically disconnected from the motor-driven machine the instant the operator leaves his station or for some other reason removes his hand from the master switch. A typical example is a transfer (or larry) car with a *spring-return* master switch mounted on the side within reach of the operator as he walks along with the car. Should he trip and fall, the master switch automatically centers itself in the off (safe) position.

The EC&M Cam-type Master Switch (as illustrated) is ideal for this service because of the *short-throw* of the operating handle. From the "full-on" to the "off" position, the handle of an EC&M Master travels less than 40° from the sixth speed-point in either direction to the off (central) position. There's nothing to equal the EC&M Cam Master Switch for spring-return service.

## Make your own Compact Layouts with EC&M Bulletin 1190 Cam MASTER SWITCHES



### in Crane-cabs or Mill-pulpits

For new installations or when re-vamping existing equipment, take advantage of the narrow width and short-throw of EC&M Cam Master Switches for improved performance. These features appeal to operators.



Write for Bulletin 1190 giving details of these short-throw, narrow width Masters



**THE ELECTRIC CONTROLLER & MFG. COMPANY**  
2698 E. 79th STREET CLEVELAND 4, OHIO



**NEW TOOL FOR STUDYING GREASE**—Development of an apparatus that works the grease and measures its flow characteristics in the same series of operations is reported by National Bureau of Standards, Washington. Data obtained with the worker consistometer, as the new "tool" is called, indicate that it is valuable for studying the properties of lubricating greases. Principal advantages are its flexibility, wide range of shear and consistency measurements, short test cycle and its provision for characteristics flow data while working under controlled conditions. In addition to greases, bureau engineers have used the apparatus to determine apparent viscosity of rubber solutions at different rates of shear and temperature.

**AUTOMATIC QUENCH**—In discussing properties of deposited weld metal before the joint meeting of the Buffalo chapters of ASM and the American Welding Society, A. B. Kinzel, Union Carbide & Carbon Research Laboratories, pointed out that the strength of the weld metal is usually high because it receives a thermo quench by the cold material surrounding the weld which is equivalent to a water quench in the heat treating department. He also hinted that in a few short years commercial welding operations will be carried out on material as thick as 1/4-inch at speeds of 400 to 500 feet per minute.

**RADIOACTIVE TRACERS AID DETERGENT STUDIES**—First use of radioactive tracers in studying cleaning problems is proving so interesting that Wyandotte Chemicals Corp. plans to set up radioactivity labs to find out what actually happens when a surface is cleaned. In current studies, radioactive atoms obtained from the Atomic Energy Commission, are incorporated into the actual molecules of detergent components. Various materials—aluminum, steel, zinc, silver etc.—are cleaned in the radioactive solutions, and studies are then made of the interactions that take place between the solutions and solids. It is felt that continuing work will reveal fundamental principles of detergency, resulting in further improved cleaning products.

**DOUBLES PAINT "MILEAGE"**—Since installing an electrostatic spray arrangement in applying Wrinkle finishes to its sweeper housings, Hoover Co., North Canton, O., has more than doubled the paint "mileage" obtained. Finish is applied as a two-purpose coating, with sufficient material on the outside surfaces of the die castings for a fine uniform texture, while interiors receive only enough for a protective color cover.

**"MUFF" JOB THAT WORKED**—Use of an aluminum-to-steel molecular bonding process, developed during the war by Al-Fin Division of Fairchild Engine & Airplane Corp., recently helped engineers at Westinghouse to cut the weight of a giant radio broadcasting tube some 56 per cent. According to Hampton J. Dailey, Westinghouse development engineer, the tube radiator makes use of a thick shell of aluminum and a thin steel core. Difference in expansion rates of the two metals in normal service ordinarily causes failure of the aluminum-to-steel bond. However, a new technique was developed whereby an aluminum "muff" bonded to the steel liner is cooled in such a way as to preload the steel in compression so that the bond can withstand the severe thermal cycles experienced.

#### RADIO FREQUENCY HEATING—

Three basic moves should be made when considering radio frequency heating of metals, according to A. P. Bock of Westinghouse. One is an initial economic investigation to determine if the equipment involved is justified. The other is the working out of the technical solution for successful application. Third move is a final economic analysis which is undertaken if the technical solution is found to modify the original analysis made on a purely thermal basis. If the prospective application fails to pass the first step it should be forgotten. (p.94)

#### WELDING AIDS SPHERE PRODUCTION—

In manufacturing lightweight containers capable of withstanding 400 pounds per square inch of internal pressure when loaded with methyl bromide gas—a fire extinguishing agent—Walter Kidde & Co. uses 2-piece welded construction. The two halves of the sphere are cold cupped and drawn, trimmed, blanked for bosses and bosses welded in position. Halves then are joined in a butt welded by atomic gas welding. The whole assembly is heat treated by normalizing to obtain the desired qualities. (p.98)

#### MATERIALS ON THE MOVE—

Based on the idea that "production is material on the move," flow of work in the new 17-acre, one-story Yale & Towne plant is greatly improved by rearranging all departments engaged in the manufacture of gas and electric industrial trucks, scales, hoists and other units. One typical part which formerly required 22 operations and was moved 45 times a total distance of 10,140 feet now travels only 3380 feet. (p.100)

#### FAST TAPPING METHOD—

One of the newest methods of opening tap holes of blast and open hearth furnaces is reported to employ a shaped or hollow explosive charge to punch a hole through the crust of the tap hole. When used on blast furnaces, technique is said to provide a full-stream flow of iron almost immediately, the iron trough being filled within half a minute. Referred to as jet casting, the method reduces by several minutes the total cast time. It also provides more uniform taps. At present Arthur D. Little, Republic and du Pont are involved in experimental procedures. (p.108)



# Radio

By A. P. BOCK  
Section Engineer  
Industrial Electronics Division  
Westinghouse Electric Corp.  
Baltimore

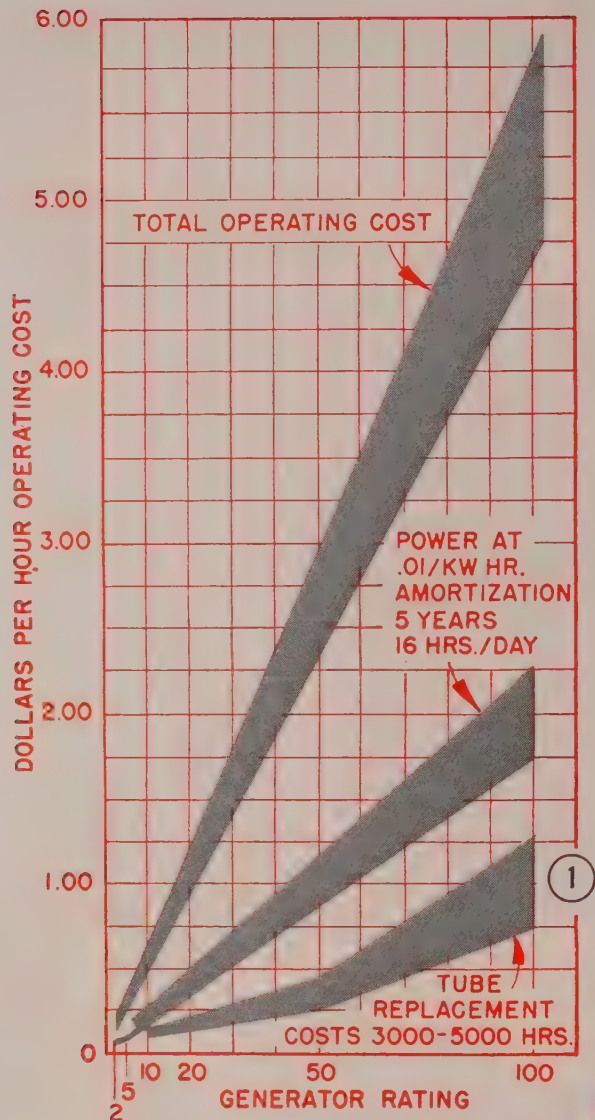
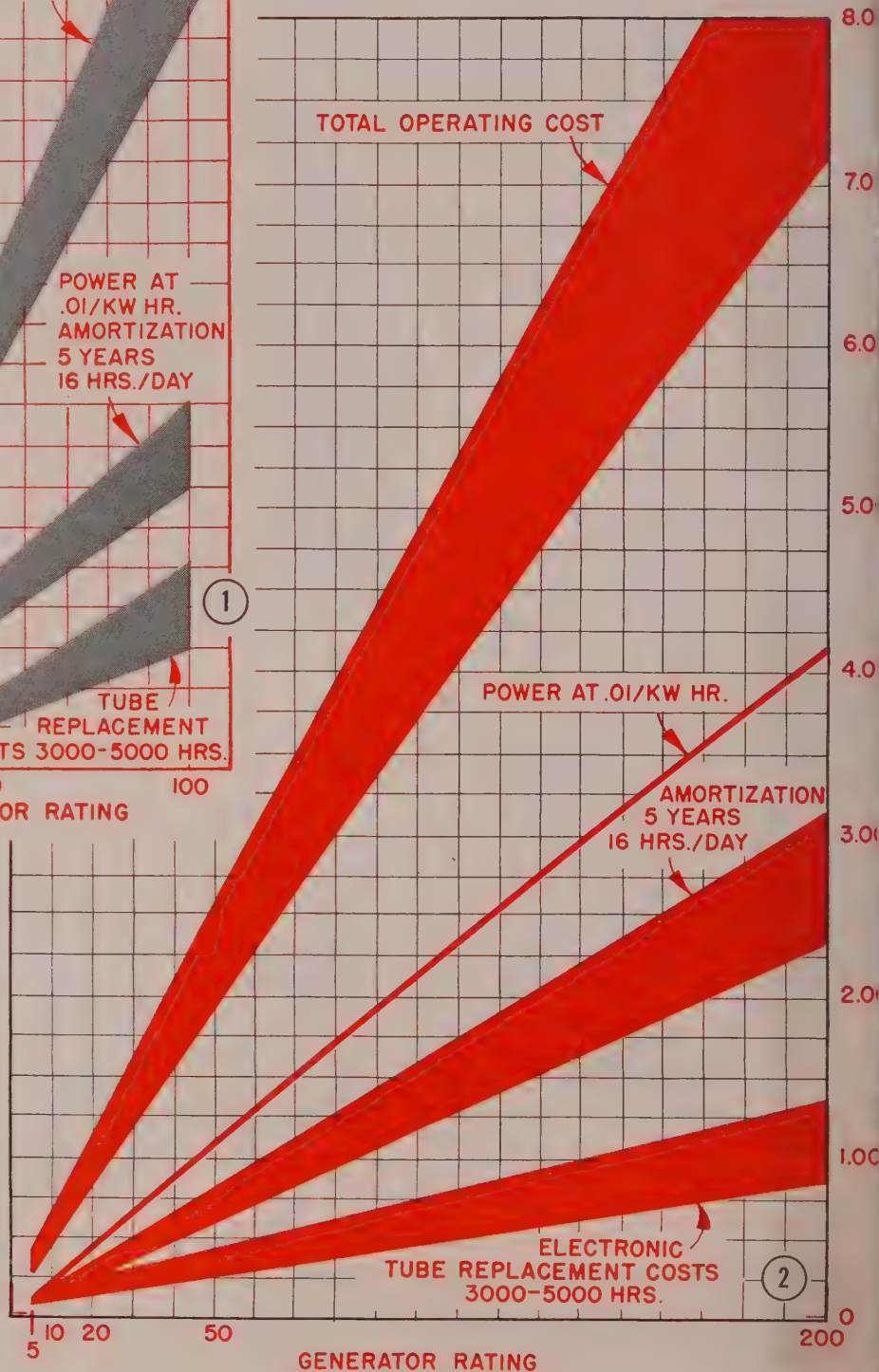


Fig. 1—Basic operating costs of oscillators for dielectric heating

Fig. 2—Basic operating costs of oscillators for induction heating

Fig. 3—A 10-kilowatt radio frequency generator is used by Hancock Mfg. Co., Jackson, Mich., to harden cutting edge of grass-shear blades. Work handling equipment is automatic, hopper holding the 3-minute supply of blades. After heating, blades are ejected into basket in the quench tank





# ECONOMICS OF Frequency Heating

*Successful, economic application of this heating method depends largely on careful preliminary study to solve cost and technical problems before equipment is installed*

AS IS the case with any new process, radio frequency heating must pay dividends to its owner in one way or another, either in the form of lower processing costs or in superior quality of product, or both. For this reason, in extending its use, the economic feasibility of the technique for each application must be determined.

In the interest of making it possible to predict conveniently the cost of the radio frequency heating portion of a process, a number of curves, Figs. 1, 2, 4, 5, 6 and 7 have been prepared. Costs are shown in various forms to cover several types of radio frequency heating applications.

**Two Heating Methods**—Radio frequency heating can be divided into two methods of heating: Induction and dielectric. Induction heating methods selectively heat metals or other electrically conductive materials for processes such as surface hardening of steel, soldering, brazing, flowing of tin on tin plate, tempering and annealing of steel, stress relieving, shrink fitting of metals, activation of carbon and many

others. A hardening application is shown in Fig. 3. Dielectric heating methods generate heat within materials that are so-called nonconductors or poor conductors of electric current.

Three basic steps are involved in the successful application of radio frequency heating: 1. An investigation of the economics before the technical development work is started; 2. the technical solution, if the economic investigation indicates that radio frequency heating equipment is justified; 3. a final economic analysis, if the technical solution is found to modify the original analysis that was made on a purely thermal basis.

Assuming that the technical solution has been or can be made, the investigation of the economics before the technical development work is as follows: First determine the thermal requirements of the job in terms of kilowatts of radio frequency power for the production rate being considered. This can be done readily by applying the following relations:

$$KW = \frac{\text{lbs/hr} \times \text{specific heat} \times \text{degrees rise } F}{3413} \quad (1)$$

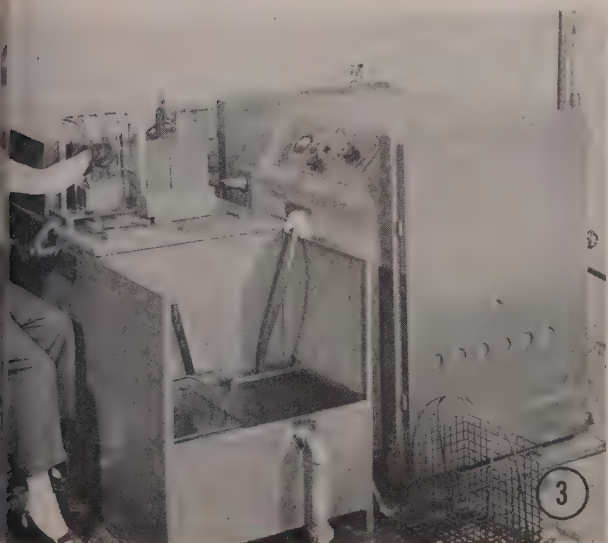
If any water will be evaporated during the heating cycle, estimate the amount and determine the kilowatts required to evaporate this amount of water.

$$KW = \frac{\text{lbs/hr of water evaporated} \times 970}{3413} \quad (2)$$

The sum of equations (1) and (2) above, plus 10 per cent is a fair indication of the generator rating required at this stage of the investigation.

Obviously, the generator rating selected must be equal to or greater than the thermal requirements. Standard ratings available are indicated by the numerals of the horizontal scales of Figs. 1 and 2. Should the thermal power requirements exceed an available rating of a generator by a small amount, one can consider adjusting the production rate downward a proportionately small amount to maintain a maximum economy. In some cases, when the thermal power requirements are out of line with the available generator ratings, two or more generators with ratings that are a multiple of the power requirements can be considered. It is good practice to allow about 10 per cent additional generator rating to take care of thermal radiation losses. This is an average figure, but should suffice for this phase of the investigation.

Other factors may require a higher rating of gen-





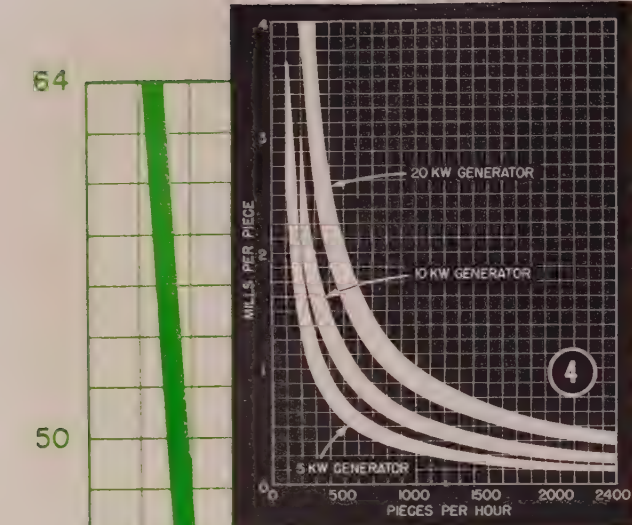
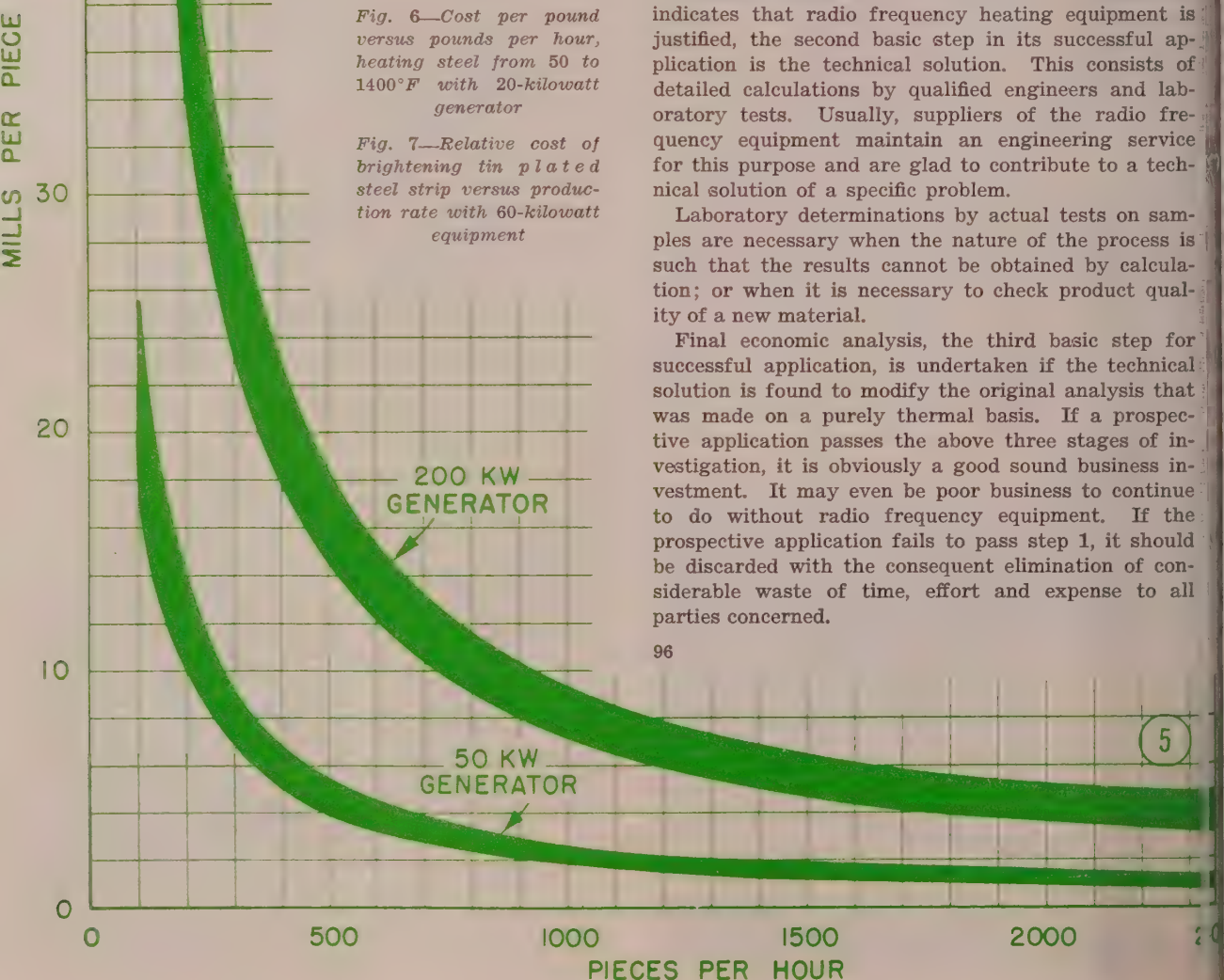


Fig. 4—Cost in mills per piece versus production rate

Fig. 5—Cost in mills per piece versus production rate

Fig. 6—Cost per pound versus pounds per hour, heating steel from 50 to 1400° F with 20-kilowatt generator

Fig. 7—Relative cost of brightening tin plated steel strip versus production rate with 60-kilowatt equipment



erator than the thermal requirements would indicate, but they need not be considered yet.

**Approximate Heating Costs**—Second step is to approximate the heating costs from the appropriate curve, Fig. 1 or 2. Then add any labor costs (unskilled operators can usually be employed.)

Finally, add amortization of work handling machinery when such is contemplated. When simple fixtures are required, the cost of this item may be neglected in a preliminary analysis. For semiautomatic machinery, a figure of 25 per cent of the hourly cost of amortization of the generator selected is suggested. For full automatic machinery for handling the work, a figure of 75 per cent of the hourly cost of amortization of the generator selected is suggested. These values are, of course, subject to wide variation on specific jobs, but they can be used as "bench marks" in average cases.

The figure so obtained should indicate whether or not the radio frequency heating process appears to justify itself as compared to existing production methods or other possible systems. When radio frequency heating appears to be justified, these calculations are a guide to seeking the technical solution and reducing it to practice.

**Technical Solution**—If the economic investigation indicates that radio frequency heating equipment is justified, the second basic step in its successful application is the technical solution. This consists of detailed calculations by qualified engineers and laboratory tests. Usually, suppliers of the radio frequency equipment maintain an engineering service for this purpose and are glad to contribute to a technical solution of a specific problem.

Laboratory determinations by actual tests on samples are necessary when the nature of the process is such that the results cannot be obtained by calculation; or when it is necessary to check product quality of a new material.

Final economic analysis, the third basic step for successful application, is undertaken if the technical solution is found to modify the original analysis that was made on a purely thermal basis. If a prospective application passes the above three stages of investigation, it is obviously a good sound business investment. It may even be poor business to continue to do without radio frequency equipment. If the prospective application fails to pass step 1, it should be discarded with the consequent elimination of considerable waste of time, effort and expense to all parties concerned.

If the prospective application falls into a borderline case, it is advisable to have a recheck made periodically, since applications of radio frequency heating are in an intensive development stage, and new techniques are being discovered and developed continuously.

**Discussion of Curves**—Fig. 2 shows the basic operating costs of radio frequency induction heating equipment, versus output ratings. Ratings available at the present are 2, 5, 10, 20, 50 and 200-kilowatt generators. Total basic operating costs are broken down into power costs at \$0.01 per kwhr, amortization costs and electronic tube replacement costs. Since labor costs incidental to particular processes would vary considerably with the nature of the process being considered and the geographic location of the plant, they are excluded from all curves. They should be estimated and added, however. Generally, labor costs will be found to be quite low, because most radio frequency heating applications fit into production line operations. Also, it has been found that in most applications unskilled labor is adequate for processing by the radio frequency heating method.

Fig. 1 shows the basic operating costs of dielectric heating equipment, versus output ratings. Ratings readily available for this class of equipment are 2, 5, 10, 20, 50 and 100-kw. Frequencies used range from 5-mc through 40-mc. Usually one generator is built for one operating frequency because the absolute value of frequency used is seldom, if ever, found to be critical as far as heating is concerned.

When the duty cycle of a generator is 75 per cent or more, Figs. 4 and 5 show the approximate heating costs per work piece of a heating operation, versus production rate in pieces per hour. After size of generator, heating time per work piece, and loading and unloading time have been determined, radio frequency heating cost per piece can be approximated conveniently from these curves. Labor chargeable to the heating operation should be estimated and added to the amount indicated on the curves. These curves also show at what range of production rates the cost-rate change is great and at what production rates it is small. For example, if the production rate falls in

the flat region of the cost curve, the unit cost is relatively stable for variations of production rates, but if the production rate falls in the steep-slope region of the curve such is not the case.

Fig. 6 shows the radio frequency heating cost per pound for heating magnetic steel from 50°F to 1400°F continuously when using a 20-kw radio frequency generator.

Fig. 7 illustrates the radio frequency heating cost variation per ton of product for various production rates in tons per hour for the induction heating process of brightening by melting electroplated tin on tinplate in a continuous process with 600-kw radio frequency equipment.

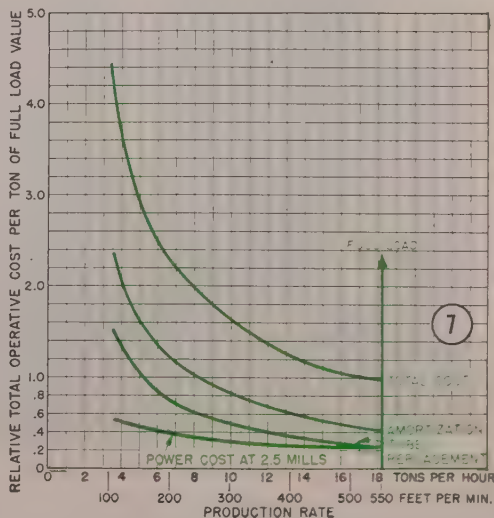
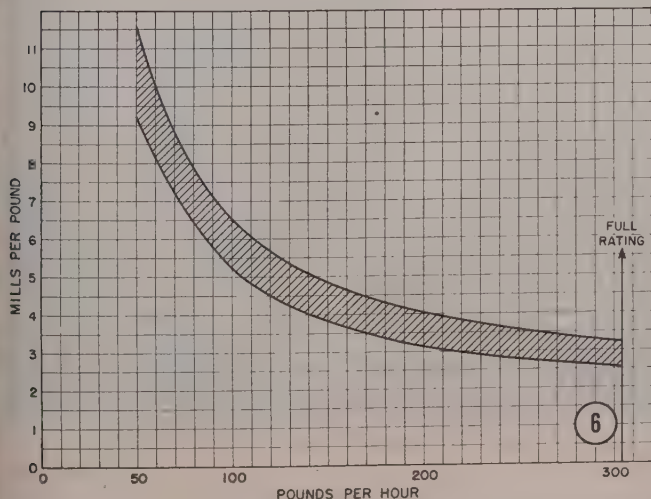
**Operational Factor**—In most manufacturing processes it has been found by actual experience that operation cannot be maintained a full 100 per cent of the scheduled working hours. Flow of materials may be interrupted or in the case of multi-purpose uses, setup operations create some idle time. Therefore, it becomes necessary to take into account such operational factors as any particular process or program of processes may demand.

The cost per piece can be approximated from the curves, Figs. 4 and 5 by multiplying the full load production rate, maximum capability of a radio frequency generator, by the estimated operational factor and reading the cost per unit from the curve corresponding to the reduced average production rate.

Cost per hour with operational factor reflected therein can be approximated by first determining the operating cost for stand-by operation. For this condition, the power cost will be approximately 25 per cent of the full-load power cost. Then by adding the proportional costs per hour, the actual cost per hour reflecting the operational factor is obtained.

For example, Fig. 2 shows a total cost of approximately \$2.00 per hour and a power cost of \$1.00 per hour for a 50-kw radio frequency generator.

Then for 80 per cent operational factor, assuming the RF generator is in stand-by condition while not operating, the cost per hour would be  $0.8 (2.00) + 0.2 (1.25) = \$1.85$  per hour. (Amortization and tube replacement costs continue during "stand by".)





By D. MAPES  
Vice President  
Walter Kidde & Co. Inc.  
Belleville, N. J.

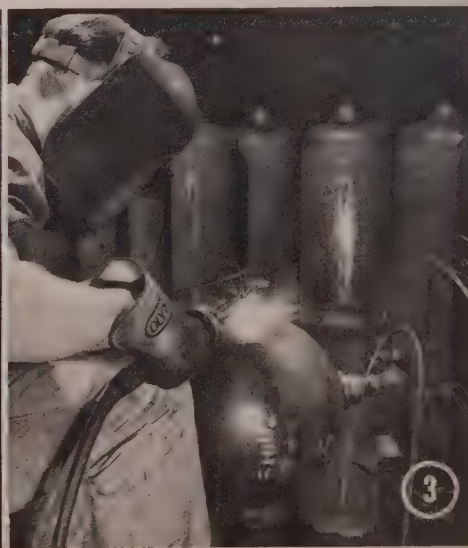
# HIGH PRESSURE

SPHERICAL

*Fig. 1—Hemisphere being removed from cold press will next be trimmed for welding and blanked for bosses*

*Fig. 2—Of each lot of 200 spherical containers, one is selected for crush test. Sphere is crushed to one-half its original diameter between steel plates*

*Fig. 3—Two halves of spherical container are joined by atomic hydrogen welding to absolute concentricity and nonporosity. Lightweight spheres have uniform wall thickness and will hold methyl bromide gas under supercharged pressure of 400 pounds, per square inch*



ADVENT of methyl bromide as an efficient fire extinguishing agent for engines in certain types of aircraft presented Kidde engineers with the problem of designing an entirely new kind of steel container for agent storage and supply. Study of the requirements of the aviation industry indicated that for methyl bromide systems spherical containers would be superior in several respects to conventional cylindrical containers commonly used in carbon dioxide systems on some aircraft and in a variety of industries.

# CONTAINERS

***... meet severe service requirements  
by two-piece welded construction***

Weight to volume ratio of spherical containers is the lowest of any container shape, and weight economy is an essential feature for all aircraft equipment. Also, spherical containers have greater resistance to gunfire than do equivalent cylindrical shapes, and this is important in military aircraft safety.

To develop a satisfactory line of spherical containers with the proper wall thickness and physical properties to hold methyl bromide gas under a supercharged pressure of 400 pounds per square inch without any leakage, be as light in weight as possible, resist the sharp impact of gunfire, and meet rigid crush test standards, was by no means an easy job.

Four sizes of containers were to be manufactured: For 30-pound capacity (12.2-inch inside diameter); 20-pound capacity (10.6-inch inside diameter); 17-pound capacity (10.1-inch inside diameter); and 12-pound capacity (9.05-inch inside diameter). Capacity in methyl bromide is figured on a 50 per cent filling density since the remainder of the space is needed for pressurizing nitrogen. In addition they were to be of two types—single and dual outlet. Also fittings for charging, mounting, safety release and pressure gage were to be incorporated in the design.

**Design Principles**—It can be shown mathematically that the theoretical weight-volume ratio of a spherical container is only 75 per cent of the theoretical ratio for a cylindrical container designed to the same wall stress. (0.0116-pounds per cubic inch for the sphere vs. 0.0155-pounds per cubic inch for the cylinder.) In the case of the cylindrical container the theoretical minimum can never be attained because the cylinder would have to be of infinite length and the ends considered weightless. In the case of spherical containers it is possible to reach the theoretical minimum.

By further mathematical analysis it may be shown that a spherical container has greater resistance to

impact than an equivalent cylindrical container. If the energy of an impact can be transmitted uniformly to the walls of any container without developing stress beyond the elastic limit, the container can be expected to withstand the impact without failure. If the energy cannot be completely absorbed within the elastic limit, increase in stress will proceed into the plastic range and may continue until the container fails by rupture.

During plastic flow the container will absorb energy and dissipate it so that it will not be available for further destructive effort upon container rupture. The energy absorbed during elastic flow, however, is not dissipated, but is liberated upon rupture and must be considered as contributing to the destructive effort if rupture occurs.

Although it will usually be impossible to secure uniform transmittal of an impact effect throughout the walls of a container, nevertheless the ability to absorb energy during elastic flow and to dissipate it during plastic flow is useful in evaluating the relative ability of various containers to withstand shock. The container capable of absorbing and dissipating the most energy may be expected to resist failure or rupture best.

For a given volume of container, the elastic energy absorbable by a sphere is approximately twice that of a cylinder per unit of weight. The plastic energy absorbable by a sphere is more than twice that of a cylinder per unit of weight. Thus, as it has been proved in practice, spherical containers are capable of absorbing considerably more impact energy than are cylindrical containers.

**Sphere Manufacture**—Guided by these principles governing weight-volume ratios and impact resistance, the company considered and tested various alloy steels in experimental models of spherical containers. X-4130 steel was finally selected as having the most desirable properties for the job.

To insure a practical means of manufacture for light-weight containers with uniform wall thickness, two-piece welded construction was employed. The two halves of the sphere are cold cupped and drawn, trimmed, blanked for bosses and bosses welded in position. Next, the halves are joined in a butt weld by atomic gas welding and the assembly heat-treated by normalizing to obtain the desired qualities. Automatic welding by the atomic hydrogen process to the point of absolute concentricity, full and adequate penetration and nonporosity, required considerable experimentation before it was perfected for our purposes.

Spherical containers are next hydrostatically tested to 850 pounds per square inch pressure, and the permanent expansion recorded. This must not exceed 10 per cent of the total expansion at that pressure.

One out of each 200 containers must be crushed to 50 per cent of its original diameter between steel plates on a press—with the welded seam at right angles to the plates—without evidence of cracking. Containers are pickled and bonderized inside and out for protection against corrosion, and proper paint bond. The final product meets exacting 4-D specification of Interstate Commerce Commission, and all sizes have approval of the Army Air Force and U. S. Navy.



How to  
get  
results  
from

Built around its materials handling system, new plant manufacturing materials handling equipment is a paragon of efficiency in processing parts

## APPLIED FLOW

BY combining proper methods with the right equipment, engineers at Yale & Towne Mfg. Co.'s new Philadelphia plant have set up an efficient plant-wide materials handling system, based on the idea that "production is material on the move." Flow of work in the 17-acre, one-story structure is greatly improved by rearranging all departments engaged in the manufacture of gas and electric industrial trucks, scales, hoists and lift trucks. One typical part which formerly required 22 operations and was moved 45 times a total distance of 10,140 feet now travels only 3380 feet, a saving of 67 per cent. Savings of 30 to 50 per cent of distance traveled are common.

Material handled consists primarily of raw material, parts in process, purchased and manufactured finished parts, structural members, frames, unit assemblies and finished products. Physically, these items vary to extremes in size, shape and weight, and fluctuations in production schedules create variances in the quantities to be handled from time to time. While passing through successive stages of machining, fabrication and assembly, many items are subject to changes in shape, size, weight, and finish—all of which affect the manner of handling.

The general production plan calls for parts to be machined and fabricated in economical runs—usually equivalent to the plant's needs for several months. Naturally, this requires storage of finished parts and units before release to the assembly departments. A study of these factors resulted in a system that requires many different types of material handling devices, falling into three basic classifications:

1. Portable carriers and containers to hold, carry and confine material on the move, in process and in storage. This equipment is intended for material that cannot be handled mechanically by itself, and includes stacking skid bins in two sizes, plain and stacking skids, pallets, trailers, self-dumping bins, dollies, rack conveyors and special purpose work carriers.
2. Mechanical equipment to move, lift and stack material with and without the use of carriers and containers. This includes platform and fork trucks, several models of Yale Work-savers, bridge cranes, and overhead monorail conveyor, two floor-type continuous chain conveyors, and nearly 2 miles of monorail hoist installations.
3. Stationary storage facilities to hold loose material as well as loaded carriers and containers. This equipment comprises several types of sectional steel shelving for finished parts and tools, skeleton racks for skidded loads and miscellaneous racks for raw material.

Application of this equipment is patterned after the basic system used successfully at the company's old plant. For material that cannot be handled mechanically by itself, a portable carrier or container is specified for transportation and/or storage purposes. Most of our material can be moved satisfactorily in stacking skid bins. Some parts require special protection for finished surfaces; in some cases we provide for this by inserts in the skid bins, although occasionally portable containers of special design are necessary.

Bulky and unwieldy frames and unit assemblies are handled on special purpose work carriers constructed on skid-type bases for transportation by power truck. Unusually large and heavy frames are lifted and moved within departments by monorail hoists and bridge cranes, while heavy duty trailers and dollies transport them between departments.

Bulk of the raw material consists of steel plates and sheets, channels, rods, structural shapes, bars, castings and forgings. It is in handling methods and equipment for this class of material that the company made one of its greatest improvements.

For the storage of raw steel, the plant was designed with a high bay, 40 feet wide and 450 feet long, stretching from the indoor trackwell through the plant, next to the department that uses this raw material. In this bay are open areas for flat storage of steel plates, U-shaped racks for sheet steel and chain steel rods and pigeon-hole type racks for flats, angles, bars and rods. The entire bay is serviced by overhead bridge cranes of 3 and 5-ton capacity.

Fig. 3 illustrates the handling of steel plates from freight car to storage to the initial cutting operation. The 5-ton bridge crane lifts the material out of the car and moves it to the proper stack according to size. A 5-ton scale, located between the trackwell and the storage area, checks weights when necessary. The same crane pulls steel plates from storage for delivery to the first cutting operation on pantograph or shears. Down the crane bay, beyond the plate and sheet storage area, channels, flats and structural shapes are stored in appropriate racks located next to the cutoff saws and shears.

After the basic structural material is cut to size, it goes to forming and machining operations in the structural machining department. During these operations, the bulk of the material is transported on standard skids, but after the last operation, the pieces go on a new type of stacking skid for temporary storage.

When the structural assembly department gets an order to build a quantity of frames, the structural members are pulled from storage and delivered to one of the surface plates outside the 18 welding booths.

# ANALYSIS

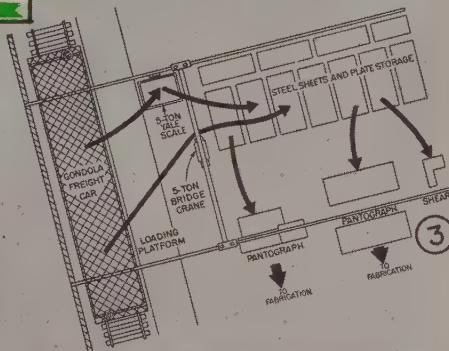
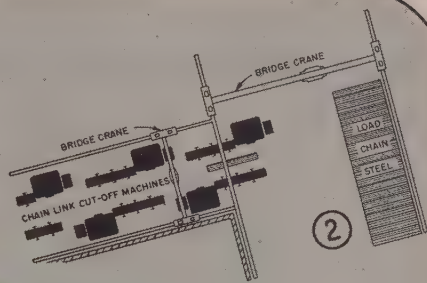
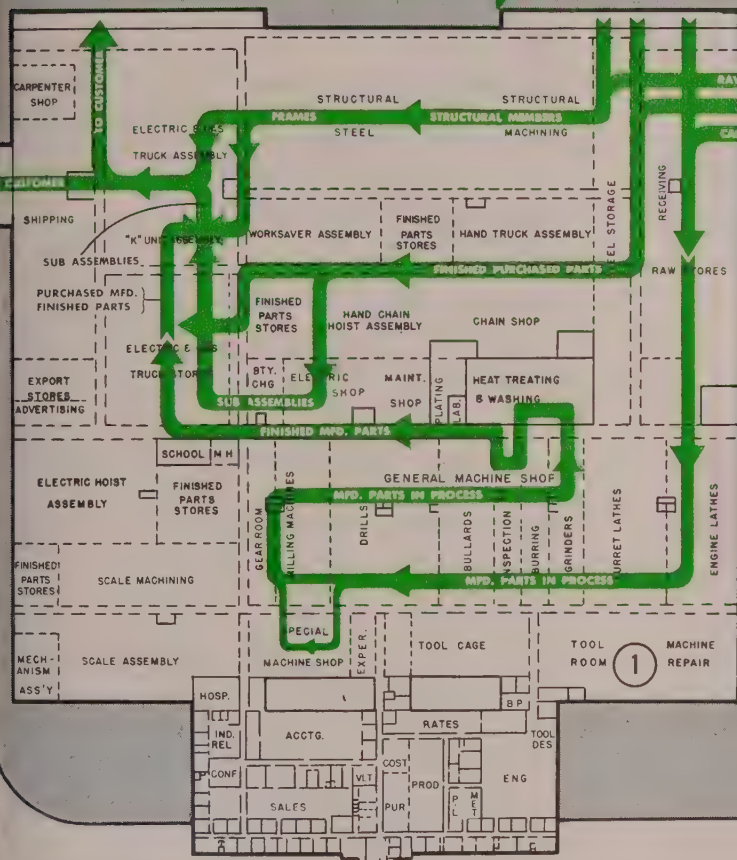


Fig. 1—General flow chart of power truck products. Fig. 2—Handling equipment for chain steel rods. Fig. 3—Handling system for sheets and plates

## LEGEND

- DEPARTMENT BOUNDARIES
- - - - - AISLES
- WALLS & PARTITIONS

Here they are placed in a frame assembly fixture for tack welding. Each frame then moves by monorail hoist into the adjoining booth for finish welding. The welded frame is then transferred to a heavy duty monorail which runs the length of the department and serves the shot blast, grinding, and painting booths. After inspection, finished frames are stored in an area 60 feet wide by 300 feet long which is entirely serviced by overhead bridge cranes.

As required, industrial truck frames are pulled from storage by crane, placed in an inverted position on a trailer or dolly and towed to the gas and electric truck ("K") assembly department. Three progressive assembly lines are laid out in "K" assembly, Fig. 1, two of which are powered by floor-type continuous chain conveyors 106 feet long. The inverted frames move down the lines on dollies while drive units and other underside unit assemblies are installed. Then the frames are removed from the dolly by overhead monorail, turned right side up and rolled to the end of the line on their own wheels.

Fig. 2 shows the equipment used to handle chain

steel rods which are one of the company's biggest items in terms of total weight. These rods are bundled in 5-ton lifts and shipped in open freight cars. The bundles are unloaded, weighed and moved to storage by the 5-ton crane, then stored intact in U-shaped racks. The same crane removes bundles from the racks and carries them to a transfer point, where a second crane transports them to the chain link cutoff machine. At this point, each bundle is placed in a rack next to the machine, opened, and the rods are fed directly into the cutoff machine.

Castings and forgings represent a large portion of the raw material. Upon receipt in the plant, clean castings are prime painted in a paint booth next to the receiving department, then put in stacking skid bins for storage in the adjoining area. Rusty castings are cleaned in a new shot blasting machine before priming. Most castings are transported and stored in skin bins between all machining and processing operations, and as finished parts they are stored either in skid bins or in sectional shelving, depending upon quantities and demand.



# Hardening Capacity of

# Engineered

Increasing importance of heat treating engineered metal castings for improved tensile and impact properties, as well as for wear-resistant purposes requires more attention be paid to hardenability characteristics and to factors which affect their magnitude

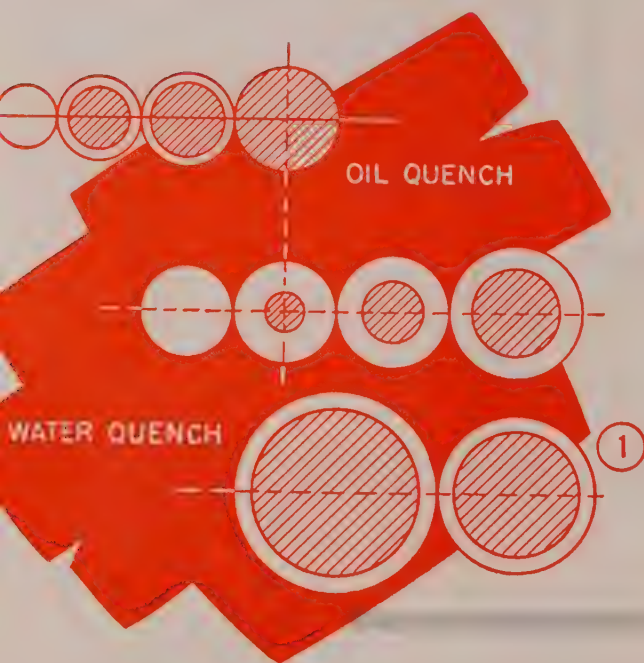


Fig. 1—Diagrammatic representation of round bar's reaction to quenching in water and in oil. White areas indicate martensite or full hardening. Shaded areas indicate pearlite regions which failed to respond to hardening. After Grossman

Fig. 2—Showing effect of carbon content on maximum surface hardness which can be obtained on quenching. The data also indicate that alloy additions do not materially change the maximum hardness value

Fig. 3—Plot of hardness data with typical end-quench hardness curve obtained on type GA Meehanite metal

Fig. 4—Characteristic curves depicted in Fig. 1. Graph gives the specific relation of bar diameter ( $D$ ) to unhardened core diameter ( $D_u$ ). A bar less than  $1\frac{1}{4}$ -inch

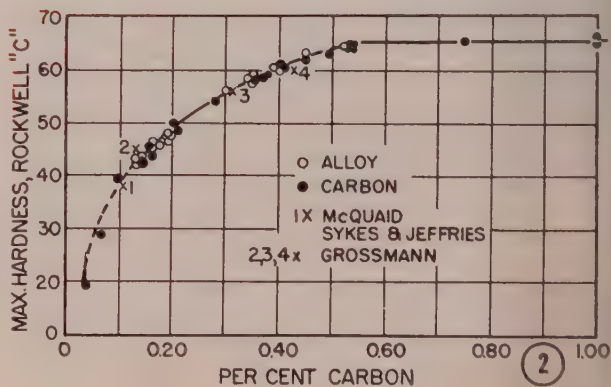
POTENTIAL hardening capacity of any metal depends on the type and on its chemical composition, particularly with respect to silicon and manganese content. This potential hardening capacity is known as the "hardenability" of a metal.

Several methods have been used to measure this property of hardenability. They include the Jominy end-quench test, the cone test, the Shepherd fracture test and the etch test on polished round bars of varying diameter. Purpose of all these tests is to determine to what depth the metal will fully harden when quenched in a given medium independent of the absolute or surface hardness value attained.

Maximum or absolute hardness value which can be produced on the surface of a simple iron-carbon alloy or of one containing any of several alloying elements is dependent wholly on carbon content. This is clearly indicated in Fig. 2, which shows the maximum hardness in terms of rockwell C as a function of carbon content.

Data were obtained from plain carbon and from SAE alloy steels. It may be observed that the hardness as defined by resistance to deformation of a penetrator is independent of the alloy content of the steel. Hardness does depend, however, on the carbon content of the metal when below about 0.6 per cent carbon but with increasing carbon content beyond this amount, full hardness can be obtained independent of carbon analysis.

When a section of Meehanite metal is hardened by



diameter will harden fully to the center when quenched in oil, whereas a bar less than  $1\frac{1}{4}$ -inch diameter will fully harden when quenched in water. After Grossman

# Metal Castings

By C. R. AUSTIN  
Meehanite Metal Corp.  
New Rochelle, N. Y.

quenching, the extent or depth to which it is hardened is governed by;

1. Hardening capacity of the material to be quenched, and
2. Rate at which the piece cools, which is governed by both the size of the casting and by the type of quenching medium—oil or water.

Matrix of a Meehanite metal engineering casting should always contain not less than about 0.6 per cent carbon so that we are not concerned with absolute hardness; and, as we have observed, alloying elements will not affect this absolute hardness to any appreciable degree.

**Hardenability**—It is well known that when a Meehanite casting is heated just above the critical range, the pearlite changes to austenite. If the temperature is further raised some of the flake graphite (and any free carbide which may be present) also tends to pass into solution and so raises the carbon content of the austenite. Thus at all temperatures above the critical range, short of melting, a simple structure is obtained which consists of grains of austenite containing some 0.8 per cent or more of dissolved carbon as the matrix, with excess free flake graphite or cementite in quantity and distribution essentially similar to that observed in the casting at room temperature.

When the matrix structure obtained at temperatures above the critical is cooled, it changes either to pearlite or to martensite, dependent on the rate of

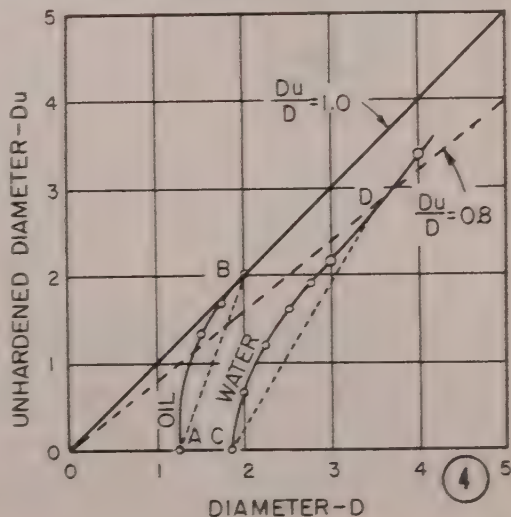
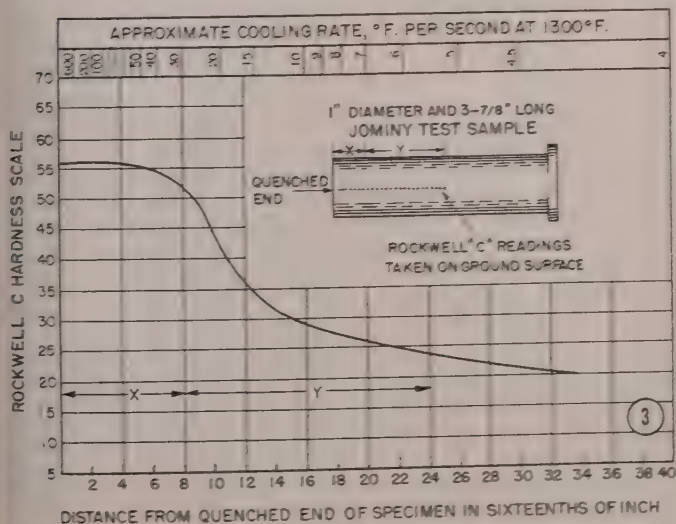
cooling. The cooling rate which must be exceeded to prevent the formation of pearlite and hence to assure austenitic decomposition to hard martensite is called the "critical cooling velocity."

Accordingly, any portion of a casting which is cooled at a rate exceeding this critical cooling velocity will show full martensitic hardening from a transformation occurring at 300 to 400°F. When the cooling rate approximates that of the critical cooling velocity, a mixture of martensite and pearlite will be obtained.

If a casting is to be fully hardened to the center, this can clearly be accomplished only if the cooling rate at the center of the casting exceeds the critical cooling velocity of the type metal poured. As the quenching medium is changed from oil to water, severity of quench is increased, but with heavy castings a severe water quench may be insufficient to cause a rate of cooling at the center of the casting, exceeding the critical cooling velocity. In such instances the casting will have a core showing a pearlite structure after quenching.

Factors which are chiefly responsible for changes in critical cooling velocity include:

1. Type of casting. Thus Meehanite metal type GA quench hardens more readily than type GC engineering iron.
2. Time and temperature of holding above the critical range.
3. Alloy content—the most important factor.





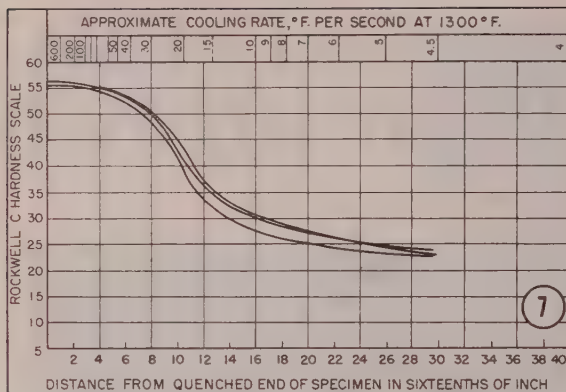


Fig. 7—General hardenability characteristics of type "GA" metal as shown by curves obtained from three different typical castings

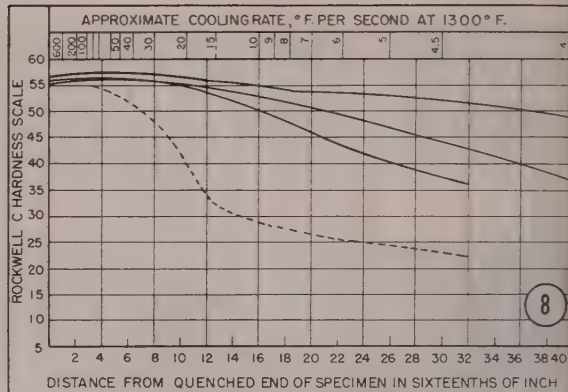


Fig. 8—Hardenability curves of type "GM" metal. Depth of hardening may be modified according to foundry procedures

practicable to attempt to survey and to generalize the many conditions which may be encountered. It is customary, however, to consider the relation between the extent of Jominy end-quench hardenability and the reaction of round bars of varying diameter to depth of hardening (hardenability) in various quenching media.

It is common knowledge that a greater depth of hardening will be obtained with any given iron-carbon alloy, the less the diameter of the section to be quenched. Similarly, for any given diameter bar, the depth of hardening will be greater, the greater the severity of the quench treatment. A comparison of the quenching power of oil and water furnishes an excellent example for the latter statement.

Diagrams in Fig. 3 illustrate the following points:

1. Depth of hardening is greater, the more severe the quench. Use of water instead of oil.
2. Using a constant quench, depth of hardening becomes less as the bar size is increased.
3. With the milder (oil) quench the diameter of the unhardened core increases more rapidly with increase in bar diameter than is the case with the more severe (water) quench.

Whatever the quenching medium selected, we arrive at a bar diameter in which the soft core has disappeared and the bar is just fully hardened to the center, by a process of progressively decreasing the bar size which is to be quenched. This bar diameter has been termed the "critical size" for the given metal for the severity of quench under consideration.

**Critical Size Varies**—This "critical size" will naturally vary for different quenching media, Fig. 4, and the maximum size will be obtained only with maximum severity of quench. Such a diameter of bar is then de-

fined as the "ideal critical size". Dimensional relationship of the hardenability characteristics shown in Fig. 1 are given in Fig. 4. The unhardened diameter ( $D_u$ ) will always be less than the bar diameter unless complete absence of hardened periphery obtains, as is the case of the 2-inch diameter bar quenched in oil.

A family of curves like AB and CD can be drawn for all varieties of quenching media for the particular steel or iron represented in Fig. 1.

The sharp transition from hard martensite (white) to pearlite (shaded) shown in Fig. 1 is not obtained on quenching Meehanite castings since a transition zone usually accompanies the quenching operation. This transition zone of mixed structures is indicated by the gradual drop in hardness shown in Fig. 3 between approximately 8/32 and 12/32 distance on Jominy end-quenched bar.

Finally we should consider the relation of the Jominy end-quench data to the round bar hardenability as discussed in the preceding paragraph. Most usual method of inter-relating these two quenching methods is to indicate the bar diameter which will just harden to the center as a function of hardenability found by the Jominy method. Any curve which expresses this relationship must be related also to some specific intensity or severity of quench.

In Fig. 5 three different curves have been included. Those for water and for a regular mineral quenching oil refer to vigorous agitation of the test bar in the quenching medium. The curve for "still air" approximates the results obtained from a normalizing treatment with deep hardening materials.

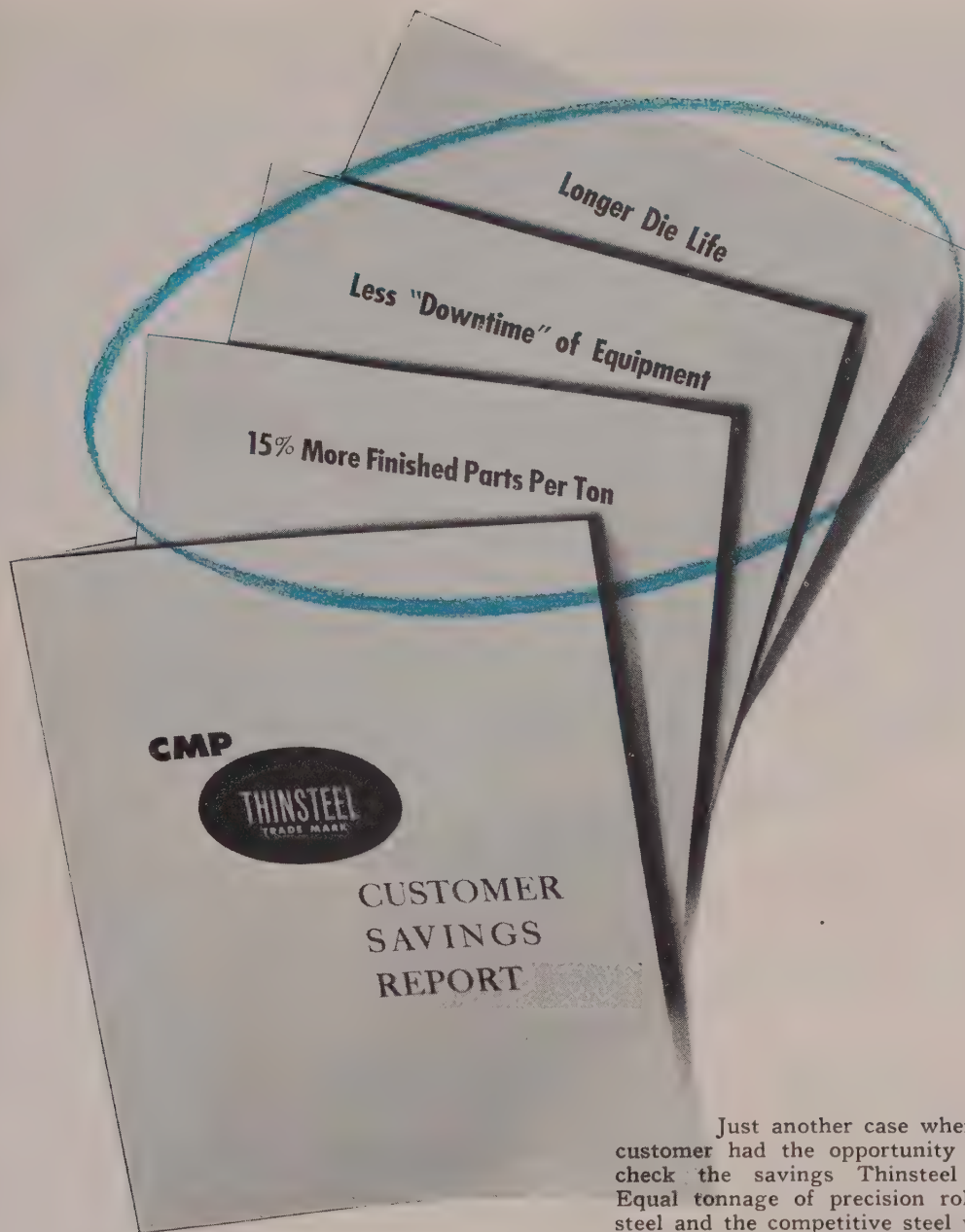
Significance of this figure can best be demonstrated by taking a specific

example. Thus assume that a 1-inch diameter Jominy bar be cut from a given casting and that on test it is found that the extent of Jominy hardening is 8/16-inch. We wish to find what maximum thickness of casting will fully harden when vigorously quenched in oil. From Fig. 5 it can be noted that 8/16 or  $\frac{1}{2}$ -inch on the "oil" curve corresponds to approximately  $1\frac{1}{4}$  inches diameter for the bar with the equivalent center cooling rate. Thus a bar cast to  $1\frac{1}{4}$  inches and vigorously quenched in oil is the maximum size which will fully harden to the center.

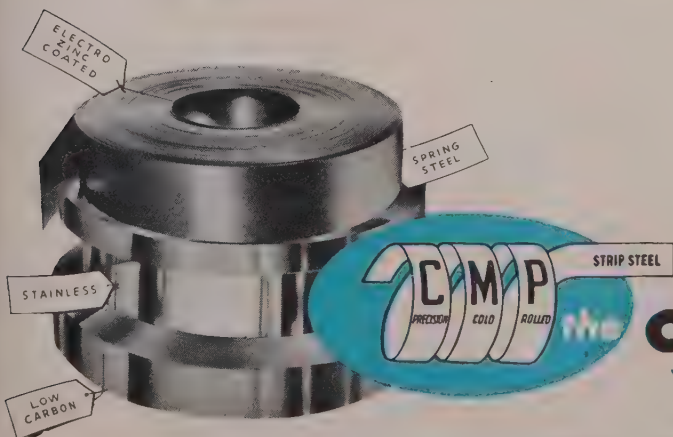
**Jominy Curves**—Meehanite metal castings can be usefully heat treated for improved tensile strength, hardness and toughness by methods frequently used for fabricated carbon and alloy steels. These treatments include conventional quench and draw, martempering and interrupted quench.

Effectiveness of such treatments is closely related to the critical cooling velocities of the irons which are in turn portrayed by the characteristics of the Jominy end-quench curves.

Accordingly, it is of importance to furnish to the heat treater, metallurgist or engineer some of these characteristics for the purpose of evaluating the potential applications of the metal to certain engineering service applications. It is generally recommended that heat treatment for improved properties should be restricted to types GM, GA and GB Meehanite metal. Characteristic response of Meehanite metal type GA to hardening by quenching is indicated by the curves in Fig. 7. Where deep hardening is needed, resort may be made to Meehanite metal type GM with hardenability typified in Fig. 8.



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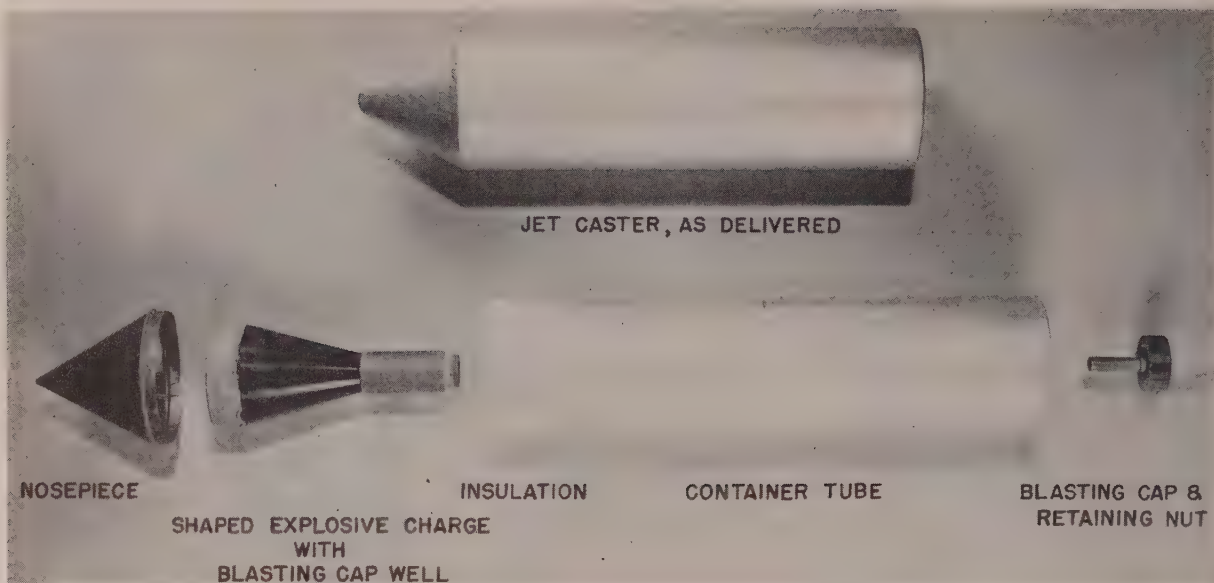


Fig. 1—Views of complete and component parts of jet caster

# JET CASTER *Technique*

## Speeds Tapping of Blast Furnaces and Open Hearths

*New device immediately brings full flow of hot metal, reduces casting time, provides uniform taps and minimizes hazards. Hard-burned ceramic bushing in blast furnace taphole is advocated as preventative against breakouts. Progress report on carbon-lined furnaces presented at Eastern States Winter Meeting*

PROGRESS in the development of a new device for opening tapholes of blast furnaces, open-hearth furnaces and other metallurgical furnaces was described at the annual winter meeting of the Eastern States Blast Furnace and Coke Oven Association, William Penn Hotel, Pittsburgh, Feb. 11, by Bruce S. Old and A. R. Almeida, both of Arthur D. Little, Inc., Cambridge, Mass.

This new method employs a shaped or hollow explosive charge called a jet caster which focuses the energy of a small amount of explosive to punch a hole through the crust of a tap hole. (Details of initial experiments with this device were presented in STEEL, Feb. 16, 1948, page 107.) Although results to date are based on limited experimental experience, it appears that this proposed practice will provide for improved and more uniform taps and reduced hazards to operating personnel.

The caster designed for blast furnace tapholes is torpedo shaped with

a shell of light-gage sheet steel, 2½ inches diameter and 10 inches long. It contains 2 ounces of explosive which is ample to make a 2-inch hole through 8 inches of cold cast iron and with a penetrating force of 5 million pounds per square inch. The caster is built with 3½ inches of insulation to permit it to remain in the iron notch for a period of 3 minutes. This is ample time for the operator to make the necessary electrical connections with the blasting machine before the potency of the charge is destroyed. Should the blasting cap fail the caster is allowed to remain in the taphole for 3½ minutes and then is removed with safety and another installed ready for firing.

The authors explained that since the days of the bar and sledge procedure to open up the tapholes, the use of an oxygen lance to burn through the crust has been accepted almost universally. After years of experience, this procedure has become routine and satisfactory.


Engineers of Arthur D. Little, Inc.,

observing trials of high top pressure operation in blast furnace of the Republic Steel Corp., sought possible alternative methods for casting blast furnaces. These investigations led to conception of the use of the shaped explosive charge for this purpose. After investigation indicated the practicality of this idea, the specific requirements of such a charge were given to the explosives division of duPont company, with a request to produce test charges.

Several explosive mixtures, the speaker explained, were available for the jet caster, one of the requirements being a high burning rate. The most stable explosive with respect to shock, friction, and heat was chosen. It is interesting to note that duPont technicians have found only one way to detonate this particular explosive—that is, with a blasting cap located in the well at the rear of the charge. Only by proper position of the cap will the charge detonate to eject the metal liner of the hollow cone of explosive as a powerful jet.

To demonstrate stability to heat and impact, the jet casters were subjected to the following treatment. A case of 24 charges was tossed into a hot box-wood and kerosene fire. The contents were burned vigorously to ashes without detonation of the explosive. Six charges were laid side by side between steel plates, and crushed by the 9-foot free fall of a 150-pound weight. These charges were crushed completely without any signs of detonation—not a whisper of smoke from any particles.

During the last 12 months, several



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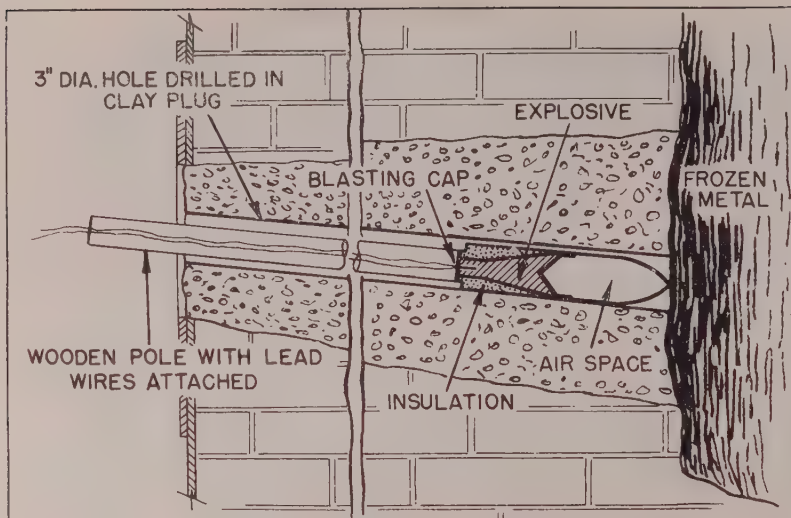


Fig. 2—Blast furnace iron notch showing firing position of jet caster

firing tests have been conducted at Republic Steel Corp. Two-ounce charges were accordingly used in subsequent blast-furnace tests and proved to have adequate penetrating power.

Mr. Old presented the details concerning 20 consecutive casts which were run in November, 1948, at the Corrigan-McKinney Works of the Republic Steel Corp., using the No. 3 furnace (17 foot, 3-inch hearth). Of these 20 casts, 18 were successful, one failed to open the hole and one partially opened it. No damage to the hole was observed. A hole deeper than normal was maintained without irregularity. The length of hole penetrated was increased from 2 feet on the first day to 3½ feet on the second and thereafter maintained for most of the time at 4 to 4½ feet. Casts were easily controlled and most were recorded as normal; on only three occasions was it necessary to cast the furnace on first check because of a too fast flow of iron.

The full-stream flow of iron is available almost immediately with jet casting, he explained. The iron trough is filled within half a minute and the total cast time is reduced by several minutes. Furthermore, the tonnage of iron per cast, which is influenced by the uniformity of the hole, is itself more uniform with jet casting. With oxygen lancing, 41 per cent of 27 casts registered tonnage within 10 tons of the average cast, while for jet casting the comparable figure was 61 per cent. The difference between largest and smallest casts was also less for jet casting.

Jet casting has also been tested in the open hearth shop at Republic's Youngstown plant. Here a 1½ ounce charge proved adequate and the tap-hole was found, in the limited experience to date, not to be damaged

in any way by continuous shooting, but rather to be cleaned out and improved. However, more careful preparation of the taphole is required for the open hearth than for the blast furnace. The dolomite plug must be raked out as far back as the burnt crust in order to accommodate the larger diameter open-hearth jet caster, which must be properly positioned relative to the bath above and beyond.

#### Results in Faster Tap

If the hole is properly prepared, however, experience to date has shown that jet casting enables a melter to tap his furnace immediately when desired, thus avoiding possible loss of specification of the steel. A faster tap also results. In 30 casts in October, 1948, the large furnaces were drained in 6 to 9 minutes instead of the usual 9 to 12 minutes. This time difference is most important, for it means less ladle skull and consequently fewer delays at the pouring platform because of frozen stoppers and poor closures.

The experience with jet casting is as yet limited, but it is encouraging. The duPont Co. plans to deliver 500 each of the blast furnace and open-hearth charges in April, 1949. These will be used in an extended production trial and in larger blast furnaces with deeper holes. Procedures for storage, handling and firing will be set up and personnel trained at the same time. When practice is satisfactory in all respects, duPont will be in a position to provide the industry at large with the jet caster.

Discussion brought out the following facts concerning the jet caster based upon observation of 20 consecutive trials at Republic's stack. The device will do the job of opening

tap holes, it facilitates lengthening the taphole, the contour of the taphole is more easily controlled, and greater uniformity in the size of cast is provided. Efficiency of the jet caster depends upon its placement in the iron notch.

Storage and handling of the jet and caps are to be further explored before their adoption and even after their effectiveness has been convincingly demonstrated.

Mr. Almeida expressed confidence in this type of explosive and asserted that there should be no difficulty in setting up regulations with safety departments.

There is no chance of a misfire either while assembling, handling or placing the jet caster in the iron notch. The operator merely attaches the caster to a wooden pole of sufficient length to position the nose of the shell against the skull. After this is done, the operator immediately goes to the blasting machine located around the furnace out of sight of the iron notch where he connects the wires with the blasting machine. The plunger of the machine then is actuated which sets off the explosive charge in the hole and causes the jet caster to penetrate the skull and bring the iron.

Sufficient insulation is installed in the jet caster to prevent the charge from melting within a period of 3 minutes. This is ample time for the operator to position the caster in the taphole, retire to the blasting machine, make the necessary connections and set off the charge. Should the caster fail to explode the heat in the taphole eventually will set off the cap but its explosion will have no effect on the charge which meanwhile will have cooked off.

Discussion also brought out the fact that thought is being given to some means of placing the charge mechanically in the taphole thus eliminating the necessity for the operator to be in front of the taphole after it is drilled and raked out.

One blast furnace man saw no point in using this device for opening tapholes. He was of the opinion that the skull is less than an inch thick and that by using certain grades of alloy steel bars there should be no difficulty in breaking through the skull. On the other hand, he pointed out, blasting destroys the beehive on the inside of the hole.

Dr. Old pointed out that while many operators believe the skull in

an iron notch is a thin crust yet early experiments with the explosive did not substantiate such claims. For instance, he stated, at the outset 34 grams of the explosive was employed to go through 4 inches of cold cast iron. This size charge failed to penetrate on many occasions. This led to the adoption of a 2-ounce charge in order to take care of an 8-inch penetration of cold cast iron; in some cases, this size charge has not been sufficient to bring iron.

W. S. Debenham, Carnegie-Illinois Steel Corp., in speaking on "Hard Fired Blast Furnace Lining", explained that the demand for this type brick has been due to its ability to resist carbon disintegration. At present the cone 17 burn is considered a minimum for this type refractory.

The speaker mentioned that hard firing contributes to better load carrying quality. The effect of porosity depends on the type of clay used. Permeability has been decreased 50 per cent.

Hard-fired bricks are best used in the hearth and bosh, the speaker asserted. In discussing the cost of such refractory it was brought out that a hard-fired lining even with a hearth laid up with carbon blocks is not as high as the cost of linings a few years ago.

### Results Are Encouraging

A Pittsburgh operator in discussing this type lining pointed out that an examination of one installation after 4½ years service showed only a small amount of wear. At the present time consensus of opinion is that this type lining cannot be evaluated until more complete data have been assembled covering operating periods of longer duration.

V. J. Nolan, National Carbon Co., in presenting his paper on "Use of, and Progress with Carbon in Blast Furnaces" presented many slides showing blast furnace construction in Germany, England, France, Italy, and South Africa with particular reference to the application of carbon. Before the war, he pointed out, 85 per cent of the pig iron tonnage made in Germany was produced on carbon linings. Sixty per cent of all the blast furnaces in Germany up to the war were lined with carbon up to the mantle. When a campaign of a carbon-lined German furnace reached around 3 million tons, the practice was to take off the furnace for repairs. In making such repairs consideration always was given to the reuse of the carbon bricks or blocks. The Germans found that the crucible area gave little trouble

though there were occasional failures around the iron notch.

In England 28 furnaces out of a total of 90 are built with carbon hearths, including both the large and small furnaces. These stacks supply 65 per cent of the total tonnage of iron made in that country.

Australia has one stack, 22 foot hearth diameter, equipped with a carbon hearth which to date has a campaign of 1 million tons. Another carbon hearth is being installed in that country.

South Africa also has 1 stack built with a carbon hearth; another shortly will be blown in.

### Carbon Linings Widely Used

In the United States, about 83 blast furnaces are equipped with carbon linings in one form or another, Mr. Nolan asserted. Of these, approximately 52 to 54 have double courses of carbon blocks and horizontal hearth and sidewalls. The remainder includes small block linings and several full thickness single linings.

Because most Germans were brought up to recognize precision workmanship, most carbon linings in that country were fully machined. Machining costs, of course, never ran high in Germany but in this country conditions are different. Carbon blocks may be had either machined or not machined depending upon whether costs are to be held to a minimum.

Mr. Nolan drew attention to the fact that in Germany no solid carbon iron notch is employed; rather ceramic taphole segments are used instead. In making up the iron notch a round tube is inserted around which is tamped a carbon face which when completed is baked up. The taphole then is stopped with a mixture of 60 per cent loam, 20 per cent fire clay and 20 per cent coal washer refuse.

Another peculiar type of construction employed in Germany is that the carbon blocks support the entire lining. Practice followed in that country is to bring a carbon-lined furnace up to heat in 24 hours; when the hearth shell is at a temperature where the hand cannot be held on it for any length of time then the water sprays are turned on.

The Germans as far back as 1892 recognized that iron notch failure with carbon hearths was based on design and that effective bottom construction can be remedied by using larger blocks.

Mr. Nolan announced that plans are being formulated to investigate erosion and permeability of carbon by running tests at certain steel

plants in this country and he hopes to reveal detailed data along this line in the near future. He also mentioned that trouble recently encountered at a stack in Buffalo and another in Lorain, O., is still unexplainable.

Discussion brought out the fact that the vulnerable places in the blast furnace are the taphole and the stockline protecting ring. Emphasis also was placed on the use of a hard-burned refractory bushing in the taphole. This, it was explained, may prevent future breakouts which are believed to be caused by a water gas reaction in the clay.

Frequency of breakouts is hard to determine and it was suggested that if the number of breakouts of a furnace per month of operation could be assembled for all furnaces in the United States the data might serve as a weathervane.

A plea also was made for more uniformity in the expansion space between the shell and lining. Tamped joints between carbon blocks were recommended. Brick assemblies at the tuyere zone are being improved and a shield is being designed to guard against trouble at this particular area.

### Recommends Thicker Lining

The speaker in conclusion stated that early recommendations for a carbon hearth included a 45-inch lining whereas at present a thickness of 57½ inches is recommended in order to bring down the operating temperatures. The reason for using coke breeze for taking up expansion rather than ramming mix is that coke breeze is a better insulator.

J. M. Howell, development engineer, Dowell, Inc., in speaking on "Chemical Cleaning of Gas Cleaning Equipment" described how gas washers are being cleaned while in service, without taking off the blast and in a matter of a few hours. Discussion of Mr. Howell's paper brought out the fact that an ammonium still at a Warren, O., coke plant was cleaned in a matter of 12 hours. No practical method is known for cleaning tar coated surfaces economically, the speaker pointed out.

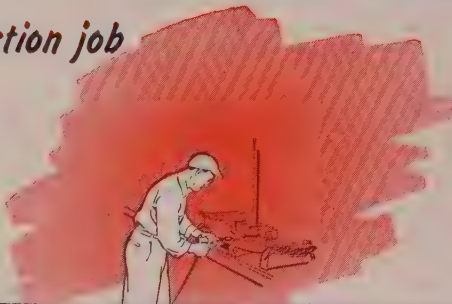
Unless the coal industry takes steps to reserve high-grade coking coals for the production of metallurgical coke, the government will have to place restrictions on the use of such coals to insure the security of the nation. This warning was voiced by Philip S. Savage, vice president, Donner-Hanna Coke Corp., at the coke oven session.

Mr. Savage in speaking on "The Blending of Coal to Improve Coke



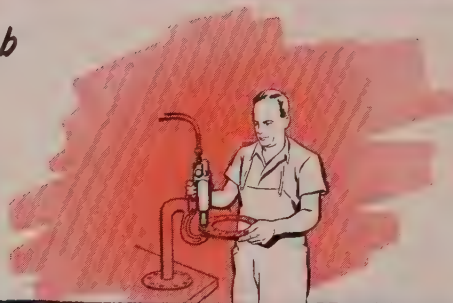
# On your jobs... in your plant...

*On automobile production job*



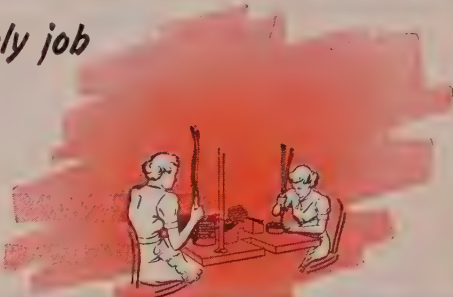
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and Extend Our Coking Coal Reserves" emphasized that the coal industry should reserve the low-sulphur coking coals for the production of metallurgical coke even though a premium is entailed to make it worthwhile for the coal industry to keep them available for only their use. The coking industry then can reduce costs and increase these reserves by learning to use coals that are not now considered as satisfactory, by most makers of metallurgical coke.

Desulphurizing of iron outside the blast furnace, and improvement in the process of removing sulphur from gas, have made it economically possible to use coals with sulphur much above the limits set a few years ago. Many plants are now accepting coals up to 1.50 per cent sulphur, and some are using coal with sulphur up to 2.00 and over. This alone has extended the reserves of coal suitable for metallurgical coke enormously, and it is believed that even higher sulphur coals can be used.

#### Preparation Is Important

While the oven is the heart of any coke plant, the coal charged is its very life blood, and much too little thought and money has been spent on the proper preparation of coal for use in the oven when the cost of preparation is compared to the cost of coke ovens proper. Adequate blending equipment can definitely save money as follows:

1. Reducing the average price paid for coal.
2. Additional oven life.
3. Improvement in the operation of blast furnace and foundry.
4. Making it possible to use coals that are available in times of strike or shortage, thus maintaining full operation when it might otherwise be impossible.

Coal shortages that have developed in the past few years, and the depletion of many former sources of high-grade coals, have made mixing equipment a much more saleable commodity, and a number of companies have recently added one or more mixer bins. No sizeable plant should operate with less than six mixer bins, and eight would often be desirable. Mr. Savage asserted that adequate mixer bins are the most practical method of blending coal under most conditions, though coal bedding under favorable conditions is even better.

Donner-Hanna in 1930 installed two extra bins to the four then in service. The speaker stated that the money spent on these bins has proven to be the best investment in plant equipment that his company has ever made. Even during the 30's when

coal of almost any kind was readily available, he explained that much money was saved purchasing coal bargains to be used in small and definite proportion, because adequate mixing was possible. Since the buyer's market in coal developed in 1942, he continued, we have saved many times the cost of the bins each year by purchasing and using substandard coals, when standard grade coking coals were not available except at extreme premiums. Not alone has this enabled a saving on the cost of coal, but it has kept the plant running through all the strike periods without any serious curtailment in operation, and this was done without seriously sacrificing coke quality or in any way endangering our ovens. We have been using strip coal for a number of years, and the use of this coal reached its climax the first half of 1948 when we were using a total of 34 per cent coal that normally would not be considered coking coal. During that period, the Republic Steel Corp. furnaces, which we serve, broke their all-time production record.

#### Two Grades Are Handled

Of the six mixer bins that we have available, three have been used for standard coals, and three for substandard coals. Of the latter coals we used 4 per cent anthracite fines, 10 Pennsylvania low volatile, mostly strip coal, and 20 high-volatile strip coal. There were times when much of the strip coal, both high and low, was badly oxidized showing coke buttons ranging from 1½ to 4½ on the British scale. Considering the high-ash content during the past few years, whether from standard sources or from substandard operations, the furnaces using this coke have done remarkably well. He contended that they would not have done any better had all the coal come from regular sources. Improvement in coals since the acute coal shortage has in the speaker's opinion come from the low-ash coals he is now able to get.

Coke oven operators have observed that at times coke appearance and furnace practice both improved when certain coals long in storage were used. The coke became blocky, the tumbler test improved, and the furnaces worked better. Certain strip coals, even when badly weathered, Mr. Savage stated, have this same effect when blended with strongly coking coals in percentages up to 20 per cent. Without any change in low volatile, our coke would block up and look as though the percentage of Pocahontas had been increased materially.

We have been using in the mix

for a number of years, 3 to 4 per cent anthracines consisting of No. 5 or a mixture of No. 4 and 5 Buckwheat having a specification requiring ash under 12 per cent, and 25 per cent or more through a 40 mesh screen. Blast furnace men charging the coke believe the anthracines can replace an equal percentage of Pocahontas up to a maximum of 4 or 5 per cent without in any way hurting the coke, and with some indications that the coke has been improved. The speaker claimed that this move alone, if generally adopted, will materially increase the reserves of the fast dwindling supply of good low-volatile coal. Use of fine anthracite also definitely decreases the expanding qualities of the coal mix, and allows the use of materially more swelling coals than can be used without it. This again opens up more coals for use in slot-type ovens.

#### Substitute Gives Good Results

Experimentally we have taken Pocahontas outcrop coal, known in the Pocahontas fields as 'bloom', and having absolutely no coking qualities, and replaced fresh Pocahontas in an 80 per cent high-volatile and 20 per cent low-volatile coal mix. The resultant coke appeared to be equal to that made with the fresh Pocahontas.

The speaker's experience with strip coals, both high and low, and with anthracite fines and fine coke dust, warrants the conclusion that coking qualities of low-volatile coal have little to do with the quality of the coke produced. The physical quality of the coke produced, providing sufficient total agglutinating material is present in the mix, is due to the viscosity of the plastic zone. If to the coal mix inert carbon material is added, which is fine enough and of such character that it will be wetted by and become part of the plastic mass when the coal is coked, such inert carbon will have all the beneficial effects now obtained from low-volatile coal additions, provided of course that the agglutinating material in the charge is sufficient.

Coal, Mr. Savage pointed out, has the characteristics of a thermal-setting plastic, and the inert material in low-volatile coal acts as a filler, just as wood flour and other inerts do in forming molded products from phenol phenolic resins.

Another example is demonstrated in the baking of bread. If the plasticity of the dough is not right, and it can be either too thin or too thick, the bread will not have uniform cell structure and will be heavy or sea-

(Please turn to Page 130)

# Bonded Resistance Wire Strain Gages

... simplify determination of creep measurements

TAKING creep measurements of test specimens by means of SR-4 bonded resistance wire strain gages instead of the conventional extensometer is reported by the Canadian Bureau of Mines. C. H. Betts, metallurgical engineer, division of mineral dressing and metallurgy, states that this method is simple, accurate and sensitive, and avoids the problem of attaching cumbersome and inconvenient mechanical devices to test specimens. Gages can be applied to more than one point, if desired, or they may permit using specimens of more convenient dimensions in some instances. The investigation was limited to measurement at room temperature.

Experimental creep measurements were made with two type A-3 gages bonded longitudinally on diametrically opposite sides of the center of the gage length of specimens. Specimens were machined from sand castings of a magnesium alloy and had an overall length of 12 inches. The parallel gage length of 10 inches had a diameter of 0.505-inch. Conventional procedures of cleaning, cementing, clamping and drying, as recommended by the testing equipment department of Baldwin Locomotive Works, were followed. Moisture proofing was done with particular care. Dried gages were coated with a liberal layer of Socony Vacuum Petrosene A wax. Strain indicating equipment comprised an SR-4 portable strain indicator used with a 20-point SR-4 switching unit. A conventional single lever arm creep machine was used for tests.

Creep measurements were checked by a mechanical extensometer system, illustrated in accompanying photograph. A dial indicator was fixed to the creep machine hanger and actuated by a metal platform freely supported by two diametrically-positioned 3/16-inch diameter rods clamped to the lower specimen adapter. Elongation of the specimen separated the machine hanger and lower

specimen adapter bar, thus actuating the dial indicator spindle and giving a direct measure of extension in the 10-inch gage length. Temperature effects were compensated by using bars of the same material as the test specimen and temperature equilibrium was established by delaying the tests 2 hours after mounting the specimen.

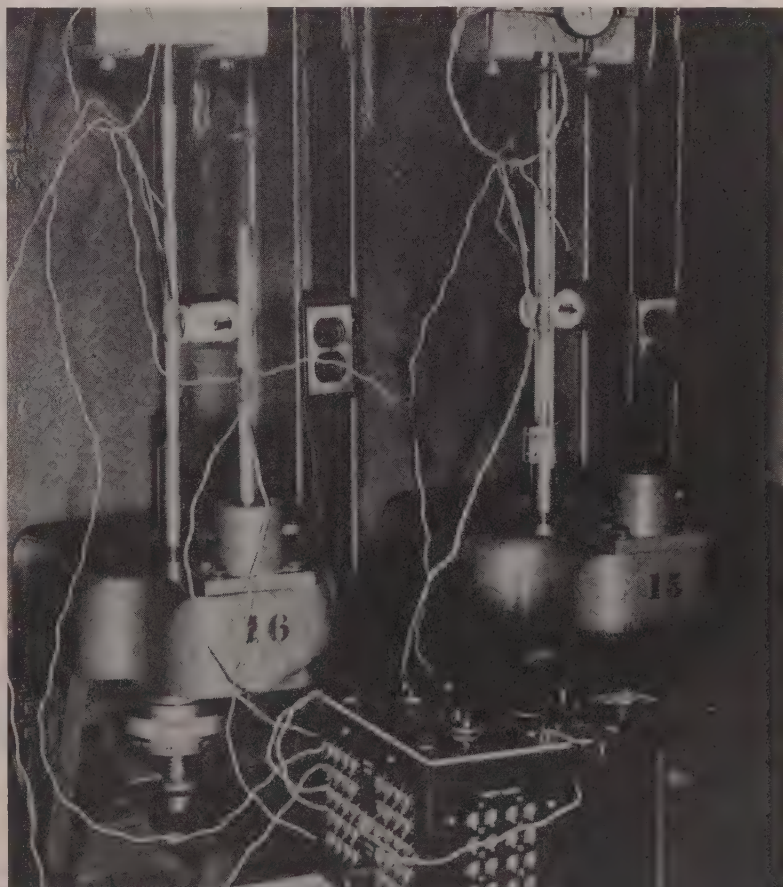
In creep measurements with SR-4 gages, room temperature variation was not under rigid control. However, approximately constant temperature was maintained by a thermostatically operated exhaust fan, and maximum temperature fluctuation was found to be less than plus or minus 2° from 21° C.

Creep bonds of 6500 to 15,000 pounds per square inch were applied gradually over a period of several minutes, elongation readings being taken immediately before and after applying the load to show initial deformation. Tests lasted 1000 hours, and sufficient strain readings were recorded to define strain-time or creep curves.

In some instances prestress loads

were applied to specimens after reaching equilibrium conditions in the creep machine, these loads being applied gradually over a period of several minutes and then slowly removed. Creep loads were applied immediately after removing the prestress loads.

Since the tests were a preliminary study, the results are not regarded as proof that room temperature creep can be measured under all conditions by this technique. An important factor in applying SR-4 strain gages is the stability of the gages themselves under conditions of constant load. Tests have indicated that a creep of the order of 35 microinches per inch during the first 700 hours (with, probably, 75 per cent of this in the first hour) may be expected in gages of the type used when constant strains of 2400 microinches per inch are present at room temperature. Further experimental work is recommended to show how SR-4 strain gages behave under conditions of constant stress at room temperature and to check the validity of the results.



*Creep test specimens mounted in testing machines with SR-4 gages for creep measurement shown at left and mechanical extensometer at right. Strain gage indicating equipment is shown in foreground*





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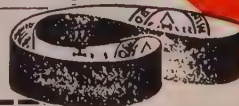
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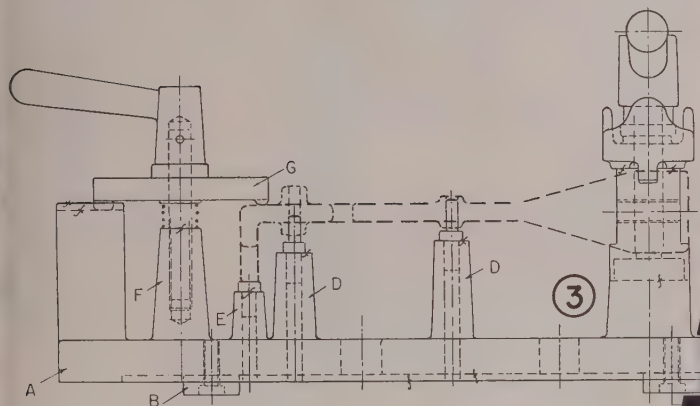
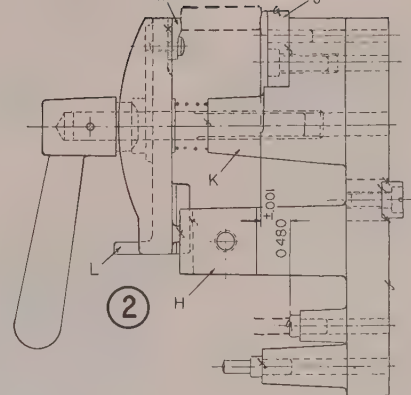
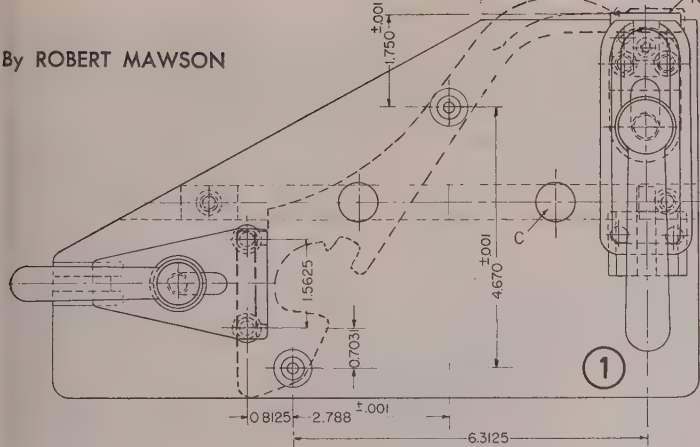
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# MILLING SLENDER CASTINGS

WHEN designing a fixture for milling a slender casting and to have the tool function efficiently, the fixture should possess the following characteristics:

The workpiece should be located accurately; it should hold the piece securely without setting up undue strains; and it should operate quickly, both when placing the part and also when removing the finish machined workpiece.

When machining a somewhat slender or frail detail the second feature noted is most important. If the holding member can distort or change the shape of the workpiece, the surface which is milled will not be true to the requirements of the drawing and it is possible that the piece will be spoiled by the machining operation.

In Fig. 4 is shown a tension bracket casting used on a textile machine. It may be classified as of slender design. The first operation on this detail is drilling and reaming the two 0.190-inch holes for which a rather simple drill jig is used. The upper pad or surface is then milled as the next machining job. In order for this surface to function properly on the finished machine the milling must be accurate both for position and alignment. The fixture built for milling

this surface is shown from three angles in Figs. 1, 2 and 3. It will be seen that this tool incorporates the important features necessary for an efficient production tool.

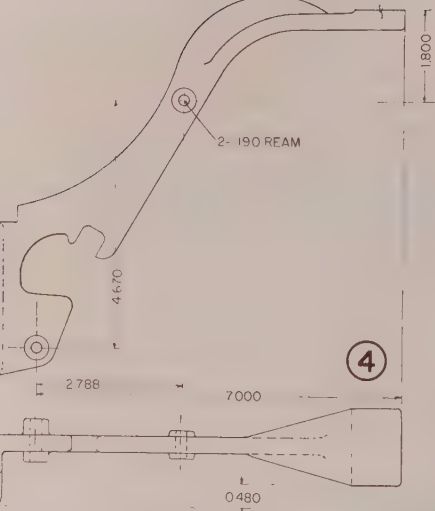
Fixture is made with a cast iron body A finished on the surfaces F, as shown in Figs. 1 and 3. In the bottom face is machined a slot in which are placed two steel keys B, each fastened with a filister head screw (see Fig. 3). These keys are machined to be a good fit in a slot of the machine table. Two holes C (see Fig. 1) are drilled in the base of a size suitable for bolts to fasten the fixture on the machine table. In the bosses D are drilled holes, in the positions shown, in which are driven tool steel, hardened, pins. The projecting por-

tion of these pins is ground to be a good sliding fit in the 0.190-inch reamed holes in the workpiece.

In each of the two bosses E is also drilled a hole in which is driven a hardened tool steel rest pin shown in Fig. 3. In the boss F is drilled and then tapped a hole for a threaded clamp stud. At the outer end of the stud is fastened, with a steel pin, a machine steel handle. The work holding clamp G is made of cold rolled steel, cyanide and hardened and designed with a three-point contact. Between the under side of the clamp and upper face of the boss is placed a tension spring to lift the clamp from the workpiece when the stud is raised by rotating the stud handle.

On a finish machine surface of the





base is attached a steel block H (Fig. 2) in which has been machined a guide groove for a projection on the clamp. On a finish surface is accurately positioned and fastened with two socket head screws and two dowel pins a tool steel, hardened locating block J. After this block has been fastened in place the top surface of the two rest pins are ground to a distance of 0.480-inch from the contact

surface in the block J.

In the boss K is drilled and tapped a hole for a clamp stud on the outer end of which is fastened, with a steel pin, a machine steel handle. The holding down clamp L is a malleable iron casting on which is fastened, with a socket head screw, a holding block M of hardened tool steel. Under this clamp is also placed a tension spring for the purpose of lifting the clamp as pressure is removed by screwing back the stud. It will be seen that a tongue and groove has been provided on both clamp designs to keep them in alignment as they are moved on or off the workpiece.

**To Use the Milling Fixture:** Fixture is first placed on the machine table being located by the tongues B fitting the table slot. The fixture is held in position by tightening the nuts on two T-head bolts which fit in the table slot and through the holes C.

The two clamps are now moved outward or clear of the path of the workpiece which is then placed in the fixture by locating on the pins in the bosses D, on the pins in the bosses E and on the locating block J. The two hold-down clamps are then moved over the workpiece and tight-

ened down with their respective studs by means of the handles, to hold the part securely in position.

An 0.050-inch feeler is now placed on the surface N and when the table has been adjusted until the milling cutter contacts the surface of the feeler the fixture and cutter are in their proper relative positions for the machining operation. The milling machine is now started in operation and the table fed along the revolving cutter and the milling operation is performed.

After the table has been moved out of the path of the cutter to remove the finished part it is only necessary to take the pressure from the piece by screwing back the two clamp studs, then slide back the clamps and the workpiece can be lifted from the positioning pins and locating blocks.

This milling fixture locates the workpiece positively, no strains are exerted on the piece which would warp or distort it, and the operation of placing and removing the piece can be performed with a minimum of lost time or effort. It can therefore be considered to be a well designed and built cost reduction piece of production equipment.

## Two Metal Powder Standards Published

Two new metal powder standards are being published by the Metal Powder Association, New York, having been prepared by the association's granular powders standards committee. The committee is composed of producers of practically all types of granular powders.

Standard 2-48T, a tentative method for the determination of hydrogen loss of metal powders, supercedes standard 2-45, method for determination of hydrogen loss of iron powder. The new standard includes the method covered by the old one and expands it to cover metal powders other than iron. Standard 6-48T, the second of the new standards, covers a tentative method for the determination of insoluble matter in iron and copper powders.

## Formulations Selected As Steel Protection Primers

Latest recommendations for the formulation of corrosion inhibitive primers for the protection of atmospherically exposed iron and steel are presented in Red Lead Technical Letter No. 3, published by Lead Industries Association, New York.

Selected by the red lead technical committee of the association, composed of lead pigment and paint industry representatives, the formulations number 11 and were selected on the basis of good performance under actual field condition.

Included are both oil vehicle and fast drying synthetic resin vehicle paints, these covering a wide range of applications and exposure conditions for shop or field priming of structural steel and other ferrous metals in a wide variety of applications.

## Power Brushing Speeds Gear Deburring

Gear deburring with tampico brushes and compound is a development that has widened the field of power brushing and accelerated trend towards more silent machinery, as well as having cut production costs. According to reports received by a Cleveland power brush manufacturer, Osborn Mfg. Co., the G. A. Gray Co. of Cincinnati has realized a 600 per cent gain in production speed in the operation of removing burrs and fragmented metal from steel gear teeth, rounding corners uniformly and producing a smooth finish with this procedure. The lengthwise and endways deburring of a standard 1½-inch six-spline stub shaft, formerly took

8 minutes by the hand method. The new brushing method takes 1¼ minutes. Brush deburring operation employed by Gray is completed by an Osborn Fascut treated tampico brushing section 16 inches in diameter and using an abrasive compound of 80-120-grit. Brushing sections are mounted on a floor stand, operated at a speed of 1750 revolutions per minute and the gears are applied to the brush off hand. The operations can also be done with a hand rotating fixture which allows the gear to revolve with the brush, a semiautomatic fixture which holds the gears and applies them to the brushes or by an automatic machine equipped with brushing heads and revolving holding fixtures for the gears.

"A Summary of Gray Iron Specifications" is the subject of a four-page bulletin published by Gray Iron Founders' Society Inc., Cleveland, which contains a resume of 14 separate sets of gray iron specifications covering automotive, high pressure, high temperature, alloy, railroad, pipe, pipe fittings and general castings. Specifying authorities include American Society for Testing Materials, Society of Automotive Engineers, American Standards Association, government agencies and others.



*Who can foretell...* the far-reaching benefits  
new Oakite cleaning methods will bring to  
tomorrow's metal-working operations?

**W**e live in fast-moving times.

Four short decades ago, when industry first employed Oakite materials to improve upon old-fashioned soda-kettle washing practices, it little realized the startling progress that industrial cleaning was destined to achieve. Nor could it conceive how Oakite methods and service would contribute to the unerring precision, efficiency, and amazing speed required in today's streamlined manufacturing operations.

The record speaks for itself. Today, industry knows it can depend upon modern Oakite materials, methods and service to keep production volume at

high levels . . . to keep unit costs low . . . to obtain uniform, durable, attractive product finishes that promote sales.

But production cleaning and its related techniques cannot be permitted to rest on past or present accomplishment. So the Oakite Engineering, Technical and Chemical Research Staffs are even today creating, testing and perfecting tomorrow's materials and methods that will contribute greatly in helping the metal-working industry reduce manufacturing costs in the years ahead. Oakite Products, Inc., 21A Thames Street, New York 6, N. Y.



*Oakite Technical Service Representatives Are Located in  
All Principal Cities of the United States and Canada*

**OAKITE**

INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE



# LETTERS to the Editors...

## "Pin-Point" Hardening

In the December 13 issue of STEEL on page 83, we noted an article on "pin-point" hardening. We would like to learn more about this method and where we could purchase some of this material. We would greatly appreciate it if you could advise us in regard to this.

Elizabeth Gleason, Secretary  
Glaze Mfg. Corp.  
Andrews, Ind.

More information can be obtained from Denfis Chemical Laboratories Inc., 172 Pacific St., Brooklyn 2, N. Y.—The Editors

## Tearsheets Being Sent

We would appreciate receiving tearsheets covering the article on "Rapid Quantitative Analysis by X-Ray Fluorescence Method" by Marcel A. Cordovi, which appeared in the Dec. 20, 1948 issue of STEEL, on pages 88 to 94, inclusive.

A. B. Castro, Metallurgist  
Sargent & Co.  
New Haven, Conn.

Tearsheets of the article are being sent with our compliments.—The Editors

## You Can Still Get Them

I hope you will pardon this rather tardy thank you note for the reprints of the series of articles on Tool and Die Materials. These reprints apparently are highly valued by those to whom we have distributed them, in

fact so much so that we now have requests for six additional copies by important people in our Tool Steel Division. Those now holding copies refuse to pass their copies on, even for reference.

Would it be possible to obtain an additional six copies for further distribution?

R. W. Saunders  
Bethlehem Steel Co.  
Bethlehem, Pa.

Copies of the "Guide for Selecting Tool Steels and Carbides" are still available from STEEL's Readers' Service Department, the charge being \$1.00 per copy.—The Editors

## Fluxing Technique

Noticing your article of January 3rd, under "Surface Treatment", which includes an article from W. H. Spowers Jr., regarding the reduction of dross by proper fluxing technique. I would like to receive some further information regarding same.

I. W. Wilenchik  
Metallurgical Products Co.  
Philadelphia, Pa.

We suggest writing directly to W. H. Spowers, consulting engineer, 551 Fifth Ave., New York, N. Y., for further information on the fluxing technique.—The Editors

## Thank You

I would like to commend you for the excellent publication which you have been producing. I have been conducting courses in advanced time study and methods engineering for

industrial engineers and plant executives of the various divisions of General Motors. We have found STEEL a helpful reference in this field. Some of our sessions have consisted of discussion periods based on a STEEL article.

Ralph H. Stearns  
General Motors Institute  
Flint, Mich.

## Dry Plating Process

We are very interested in the "dry plating process" you mention in Engineering News at a Glance, issue of Nov. 15, 1948, and have written the Commonwealth Engineering Co., Dayton, O., and hope to receive an informative reply. Do you know of any other source of information we can contact on this subject?

C. H. Whiting  
Manufacturing Policy Division  
General Electric Co.  
Schenectady, N. Y.

We do not know of any other source where you may obtain information on the dry plating process. To our knowledge, the company is the only concern involved with the process.—The Editors

## High Speed Friction Saw

You published in STEEL of Dec. 6, 1948, a picture of a friction saw. This appeared on page 142. We would appreciate your sending us the name and address of the firm manufacturing this machine.

F. H. Steinbrink, Production  
Manager  
Erie Steel Construction Co.  
Erie, Pa.

Further information on the high speed friction saw can be obtained by contacting Mr. John W. Cushing, Industrial Relations, U. S. Steel Supply Co., 208 South LaSalle St., Chicago.—The Editors

## Carbon Steel Bars Used To Replace Alloy Steels

Where specifications permit, Lundberg Screw Products Co., Lansing, Mich., is using cold finished carbon steel bars to replace more expensive chrome-molybdenum alloy steel and chrome-nickel-molybdenum alloy steel in the manufacture of certain studs for automotive and farm machinery. Commercial use of this Electreat carbon steel, a product of Jones & Laughlin Steel Corp., Pittsburgh, reportedly has enabled the company to eliminate heat treating of these studs after they are machined, this in turn meaning studs of greater uniformity and smoother finish produced at lower operating cost.

This is a cold finished carbon steel, heat treated by special electric induction equipment before it is sent

to machine shop for manufacturing into finished products. Uniformity in these bars is carefully controlled in the induction process. Individual cold finished bars are fed continuously through an electric induction coil and heated to desired quenching temperature. As bars leave the coil they are immediately quenched by a cone of water sprays which strike the steel at high pressure. Electreat steel is available in rounds ½ to 2-inch, hexagons ½ to 1¼ inch and squares ½ to 1¼ inch in lengths from 10 to 24 feet. Various grades are offered.

## Booklet Describes Soldering Technique

Advances in soldering technique, with reference to mass production methods of assembly, are discussed and the various forms of solder and


methods of applying heat to the joints are described in the Tin Research Institute (of Greenford, Middlesex, England) handbook, "Notes on Soldering," by W. R. Lewis. The importance of design for soldering is emphasized. The fundamental principles underlying the production of "wiped joints" in lead pipes are fully covered and alternative types of joint in lead pipe are described and illustrated.

Aluminum, stainless steel, cast iron and other difficult-to-solder alloys are capable of being soldered by the special methods suggested. Also included is information on the behavior of solders at various temperatures under tensile and shear stresses and under creep conditions. The 88-page booklet, illustrated with 47 photographs and diagrams, is available, free of charge, from Battelle Memorial Institute, 505 King Ave., Columbus 1, O.

DESIGNED AND BUILT BY

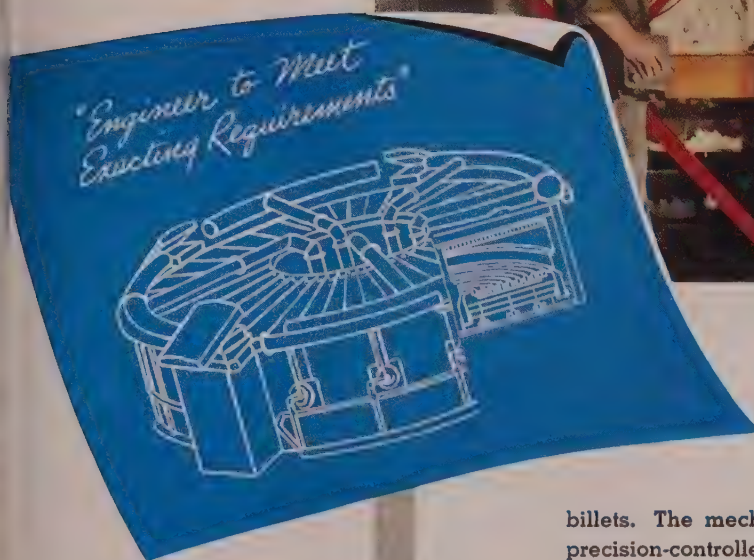
# SALEM

in a special application of Salem-proved mechanization. Giant "hands" and precision control are here combined to charge and withdraw heavy billets . . . . . smoothly, surely, swiftly . . . . . at the rate of five per minute.



ABOVE: Automatic Billet Charger

RIGHT: Automatic Billet Discharger



These full color photographs, made at the Beaver Falls, Pa. plant of the Babcock and Wilcox Tube Company, clearly illustrate the automatic charging and discharging of heavy steel

billets. The mechanisms pictured feed the most up-to-date, precision-controlled automatic heating furnace with unerring accuracy. Working at a rapid rate, the finely adjusted manipulators have put production on a flow-line basis.

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# What every mechanical tubing user should know about TIMKEN® tube engineering service

**H**AVE you ever ordered what you thought would be the right size of seamless tubing to make a certain hollow part and discovered later that you had to machine away an excessive amount of metal? Or worse, that the tubing varied so much that sometimes you didn't have enough metal to fill out to your dimensions?

If you've ever had these common experiences, you'll want to know all about the Timken® tube engineering service. This service shifts the responsibility of specifying exactly the right sized tubing from your shoulders to ours. All you have to do is send us the specifications of your finished part. We give you the most economical size of Timken tubing for your job—possibly a smaller size than you are using now. You are assured of minimum stock removal in machining, maximum saving in machining time, and you always have enough metal to fill out.

**We take all the risk! We guarantee** that the Timken tube we give you will clean up to your dimensions!

The value of Timken tube engineering service has been fully proved in selling thousands of tons of Timken mechanical tubing to users in all industries. Here's how it works:

*First*, one of our engineering departments devotes its full time to the calculation of the most economical tube size for your particular requirements. These men have had years of contact with mechanical tubing problems in practically every large scale manufacturing industry.

*Second*, every step in the manufacture of Timken tubing is rigidly controlled in our own mills, resulting in outstanding uniformity of dimensions. This greater uniformity permits a minimum stock removal in the Timken tubing you use.

*Third*, Timken has the largest assortment of roll sizes of any mechanical tubing mill in the country. This means you have the largest selection of hot-rolled tube sizes to choose from.

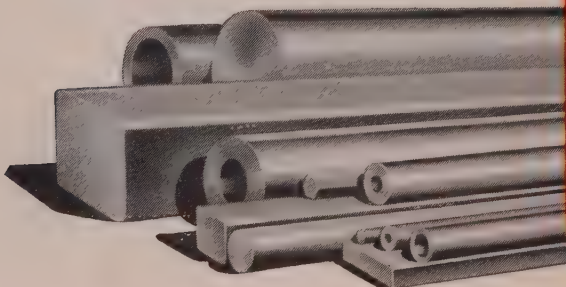
Today, 90% of Timken mechanical tubing is bought on the recommendations of the Timken tube engineering service.

To take advantage of this service, simply provide the data indicated below. No cost or obligation! The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

## All you have to do is to give us this information:

- 1 **FINISH MACHINED DIMENSIONS**, i.e.—The maximum machined O.D. x minimum machined I.D. x length. Blueprint most desirable, dimensions should include applicable tolerances. If only finish ground dimensions are applicable or available this should be noted.
- 2 **MACHINING**—Is part held on O.D. or I.D. during the initial machining operation? Complete sequence of operations when practical.
- 3 **FINISH OF TUBING DESIRED**—Hot rolled, Cold Drawn, Rough Turned, Roto-rolled or Centerless Ground.
- 4 **CHEMICAL ANALYSIS AND OTHER SPECIFICATIONS.**

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



**TIMKEN**  
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**STEEL**  
**and Seamless Tubes**

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing

Fig. 1—View of central inspection department. The inspection island has six control stations. Each is individually equipped for a particular job—load testing, pressureless gaging, magnetic comparison. Electronic indicating equipment is recessed at a level for easy reference



Central

## INSPECTION DEPARTMENT

... solves daily production problems at Hunter Spring

HEART of Hunter Spring Co.'s Lansdale, Pa., plant, both physically and functionally is the central inspection department. It represents a high state of development in applying statistical quality control methods to solving the company's daily production problems.

Principal services of the department are: (1) Acceptance testing of incoming materials, (2) controlling quality at every step in the manufacturing process, (3) checking each shipped lot and reporting results to buyers.

To begin manufacture of a spring, the "setup man" must first adjust the automatic coiling machine for the production run. When he has made the first preliminary adjustment, he produces only a few samples and delivers one to the inspection department. The sample is checked by the first piece inspector to see if it meets specification; if not then the first piece inspector must give directions for making correction to the coiler. First piece inspection is segregated from the inspection island, and the first piece inspection bench is equipped with a wide variety of gages, instruments and testing ap-

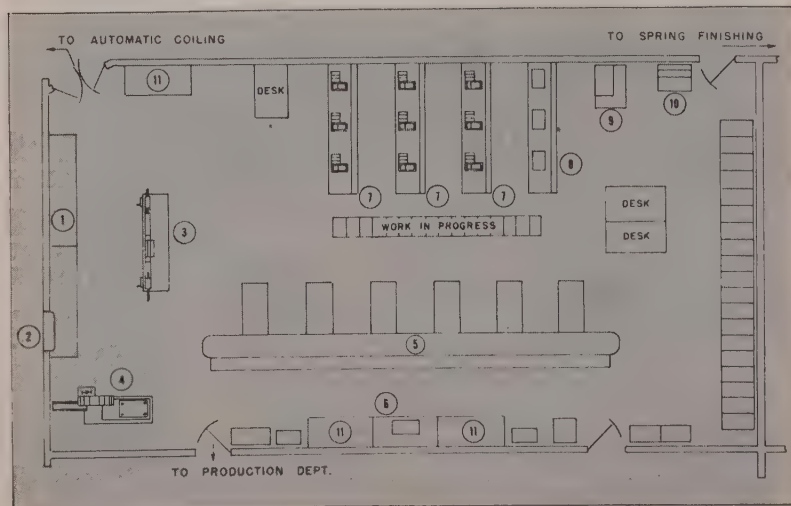


Fig. 2—Layout of central inspection and quality control department: (1) First piece inspection bench, (2) receiving window, (3) Olsen spring testing machine, (4) Olsen tension, compression tester, (5) inspection island, (6) Magnaflux seam detection unit, (7) 100 per cent testing stations, (8) special testing, gaging and adjusting station, (9) 200-pound air-operated beam type spring tester, (10) spin tester for checking motor starting switch springs, (11) general utility inspection and test stations



paratus. Until the inspector permits, the production run may not continue.

Many production runs are control charted by inspectors occupying one of the last two benches in the control island. Depending upon the possible drift of the job the number of parts to be produced and the specifications and tolerances, the control charting interval varies over a wide range—generally every 15 or 20 minutes. At each interval the inspector tests five pieces taken off production unit in sequence, and charts the average of the measured characteristics. Allowable ranges of drift, the characteristics to be checked, and other determinants, are set by the inspectors on the basis of specifications and tolerances, machine capability, and the steps to be taken with out-of-limit parts.

Inspection is frequently performed after several production steps—coiling, heat treating, hand finishing, looping, plating, welding, grinding and so forth. There is also consider-

able variation in the characteristics of the materials which are checked.

Another important function of central inspection is 100 per cent testing to cull from a production lot those parts which are beyond tolerance, either by intention or because the so-called "process capability" cannot match buyer requirements. These stations are equipped with load testers linked to electronic sounding devices. Visual inspection for nicks, burrs, and so forth is also achieved concurrently with the testing of load at length.

Every lot of springs shipped is subjected to sampling and frequency-distribution testing, and the resulting "quality report" is made available to the buyer. This is one of the most unique and valuable features of the company's application of statistical methods for quality control. Such testing is done generally with load testers, at the inspection island, although sometimes pressureless length testing and dimensional gaging is

performed, recorded by frequency-distribution, and reported.

**Layout** — Physical placement of the various control stations in the inspection department promotes efficiency of operation. The stations are segregated as to function. Instruments are carefully stored, housed and distributed for greater convenience and the elimination of motion.

Cabinets housing the electronic indicating equipment for each of the six control stations in the main inspection island are so built that the equipment is inset for panel appearance. The opposite side of this cabinet is likewise recessed (between the recesses on the control station side) and houses special testing equipment supplies, etc. On the control station side, the working benches are perpendicular to the cabinet for convenience and efficiency. Bench on the opposite side is made parallel to the cabinet.

Another feature is the arrangement of the 100 per cent inspection stations. The electronic indicating equipment is beneath the operator's table where it is out of the way. This permits additional space on the table. The force and length-measuring device is located in front of the operator and porcelain enameled trays for spring segregation during the inspection procedure are specially shaped to the task.

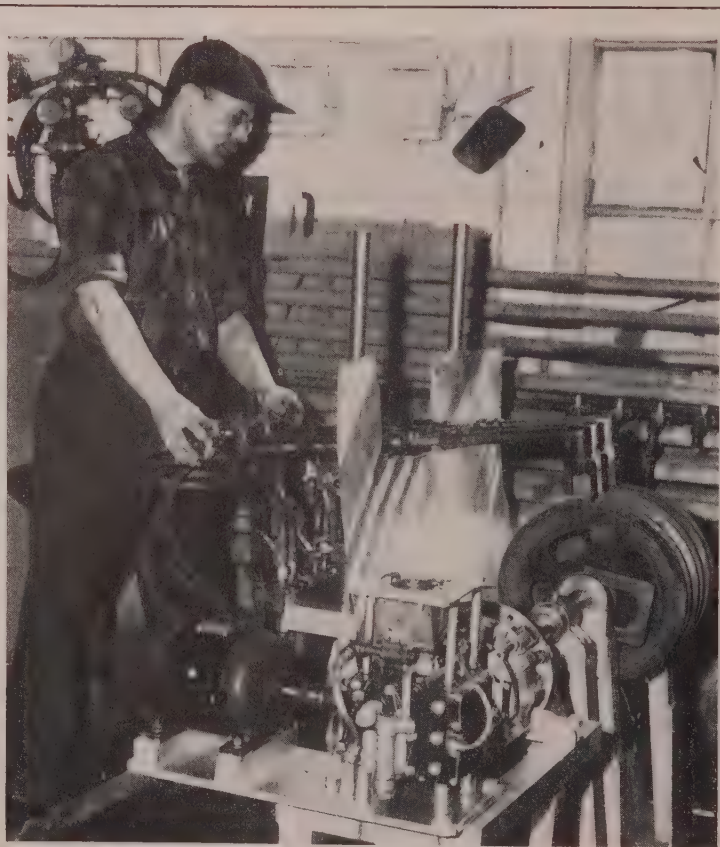
The balance of the department's facilities — supervisor's desk, work-in-progress racks, general-utility inspection and testing stations, etc., are advantageously situated.

**Instrument and Equipment**—Most important inspection units are the motor operated load testers which multiply the speed with which sample lots can be inspected. Cathode ray oscilloscopes are used to give visual indication of measurements wherever possible, and reduce gage reading to a minimum.

Pressureless length gaging of flexible parts is another quarter in which Hunter has done considerable instrument development. Units operate both horizontally and vertically—the horizontal units being employed where weight of the metal in the spring is a significant factor.

"Ganged" dial gage setups are common; they are used to check two or three, or even five dimensions at once.

Prevention and removal of rust, corrosion and scale in the cooling systems of diesel and large gasoline power engines are the functions of a new series of descaler units being made by Butler Engineering Co., New Orleans, La.



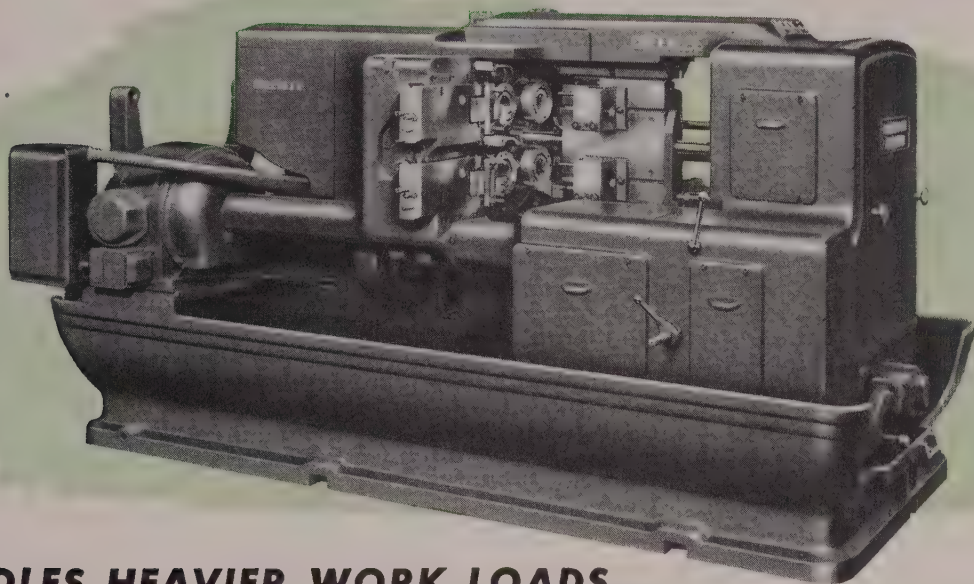
**LOCAL HARDNESS:** Selective flame hardening of three sheaves at Thew Shovel Co., Lorain, O., permits increased resistance on the throat thereby increasing work life and localizes hardness where needed, leaving balance of sheave ductile enough for proper machining. Triple torch setup and specially designed tips are supplied by Air Reduction Sales Co., New York



# GREENLEE

**RE-DESIGNED**

# 4-SPINDLE AUTOMATIC



**HANDLES HEAVIER WORK LOADS...**

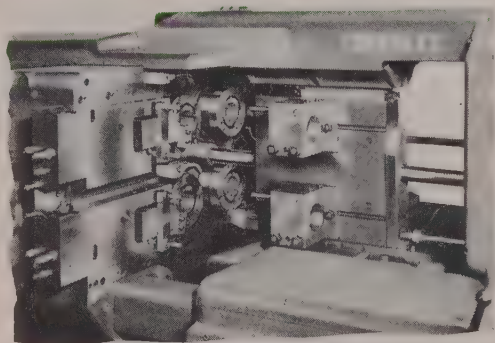
**RIGIDITY AND APPEARANCE ARE IMPROVED**

Several important structural changes have been made on the Greenlee 2-5/8" 4-spindle Automatic which increase its capacity to handle the heavier cuts demanded by ever-changing production methods.

An overarm has been added that rigidly ties the spindle carrier to the gear box, giving full support when heavy end-working tools are used. Increased lateral thrusts have been offset by tying the main tool slide to the overarm with gibbed ways.

These changes have not detracted from the accessibility of the work area. It is still wide open for set-ups and adjustments.

The Greenlee "4" embodies all the features of the popular 6-spindle machine... the convenient, built-in overarm lighting, identical tool cavities and tool holders, rapidly interchangeable cross-slide cams, quick adjustment of the main tool slide stroke, built-in coolant system, quick-change feed and speed gears, and many other advantages for maximum set-up and operating efficiency.



### **VERSATILE, ACCURATE TOOL SLIDE**

Full support of the main tool slide on the improved Greenlee 4-spindle Automatic has been achieved by using gibbed ways built into the overarm. Increased rigidity and greater precision, even under the most rigorous cutting loads, are definitely assured through this additional bearing surface. The large, roomy tool slide has ample space for mounting tools one behind the other at each spindle position. Grouping of tools in this manner allows operations on long pieces to be split up, with a substantial reduction in the machining time ordinarily required for this work. The range of operations possible on the machine is also extended by this versatility.



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& COMPANY**  
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MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES



# Magnetic Induction Drive

## To Increase Usefulness of Plant Trucks

*Phantom view of automatic drive which transmits driving force from engine flywheel to constant mesh 2-speed gear set by magnetic induction through air gap*

is vastly simplified, with the result that driver fatigue is cut to a minimum.

Referring to accompanying illustration of the transmission, two magnetic coils are mounted within the flywheel and are surrounded by magnetic poles. These rotate with the flywheel and are the driving members—one coil for forward and the other for reverse. Two rotors attached to a special forward and reverse constant-mesh gearing are the driven members. The magnetic inductive force is applied through an air gap and, as a result, there is no metal to metal contact between driving and driven members.

A selector switch on the steering column provides finger-tip control of truck movement. The switch has three positions—forward, reverse and neutral. Operating speed of the truck is controlled by the familiar accelerator pedal.

Since there is no metal to metal contact between driving and driven members, there is no need for a conventional clutch. The unit was shown for the first time at the Materials Handling Exposition recently. It was installed on a gas-powered fork lift truck of 6000 pounds capacity, and its smooth, quiet operation attracted much attention.

AN automatic transmission that promises wholly new standards of plant usefulness and low-cost performance is now being included in the latest industrial trucks manufactured by Clark Equipment Co., Industrial Truck Division, Battle Creek, Mich. Referred to as the Dynatork drive, it transmits power from the truck's engine by means of magnetic induction.

Chief among the several vital benefits to be gained from the use of this drive is the greatly increased amount of work the trucks can perform, resulting from elimination of many motions and operations heretofore necessary in driving. Jerking starts and stops are things of the past, and driving

## Coal Conveyor Carries 300 Tons Per Hour

Rubber and fabric belt more than one mile in length will carry 300 tons of coal per hour as installed on the coal slope conveyor in operation at Storrs colliery near Scranton, Pa. Designed and produced at the Passaic, N. J., plant of United States Rubber Co. of New York, the belt is said to be 250 to 400 per cent stronger, than other belts, a combination of high strength cotton and nylon fibers accounting for this increased strength.

Moffat Coal Co., operator of the colliery, expects the installation of the 36-inch wide belt to substantially increase production of anthracite inasmuch as it reopens rich veins of hard coal which have not been mined since 1931 and because it simplifies and speeds up production of coal from veins currently being mined. Prior to the installation of the conveyor system, powered by a 400

horsepower drive, coal had to be hauled more than 10,000 feet underground to the surface. The belt now hauls coal continuously to the surface from a point 2640 feet underground, a distance more than twice the height of the Empire State building.

## Standard Physics Symbols Adopted

American standard letter symbols for physics, Z10.6-1948, is the latest in the series of standard letter symbols for use in technical and scientific writing announced by the American Standard Association, New York. The standard was adopted by a representative committee working under the sponsorship of the American Association for the Advancement of Science, American Institute of Electrical Engineers, American Society of Civil Engineers, American Society of Mechanical Engineers and Society for the Promotion of Engineering Edu-

cation. Thirty-six national societies, associations, and governmental departments took part in the work.

Because physics covers such a wide field, a subcommittee of the general committee co-operated with committees in developing symbols in other fields in order that the same symbols could be used for the same idea in all fields wherever possible. All common terms in elementary physics and some in advanced physics and related fields are included. Most symbols in mathematics, crystallography, meteorology, x-rays, statistics, etc., have been omitted. Copies of the standard are available from the association, 70 E. 45th St., New York 17, N. Y., for \$1.00 per copy.

—O—

Destructive vibrations occurring in trucks and buses operating at high speeds are reportedly absorbed by an improved type of rubber cushioned propeller shaft box, development of which is announced by SKF Industries Inc., Philadelphia.

# SKIPS SHUTDOWNS

150% MORE  
COOLING SURFACE  
is provided by the radiating  
fins, exclusive with the C-W  
SEALEDPOWER. Here, fluttering  
streamers trace the fan-driven  
airstream that blows dust and  
fumes outside and away.





## CROCKER WHEELER

### ELECTRIC MANUFACTURING COMPANY, AMPERE 3, N. J.

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**Before You Buy ANY** totally-enclosed motor,  
be sure to read why SEALEDPOWER will prove a "main-  
tenance miser" for you. This new booklet, "It's Different  
—it's a Dollar-saver," is packed with facts no savings-  
minded motor user can afford to overlook. Write for it.

Crocker-Wheeler Electric Mfg. Co.  
Ampere 3, N. J.

Send the SEALEDPOWER Motor Booklet, "It's Different—it's a Dollar-Saver"

Name .....

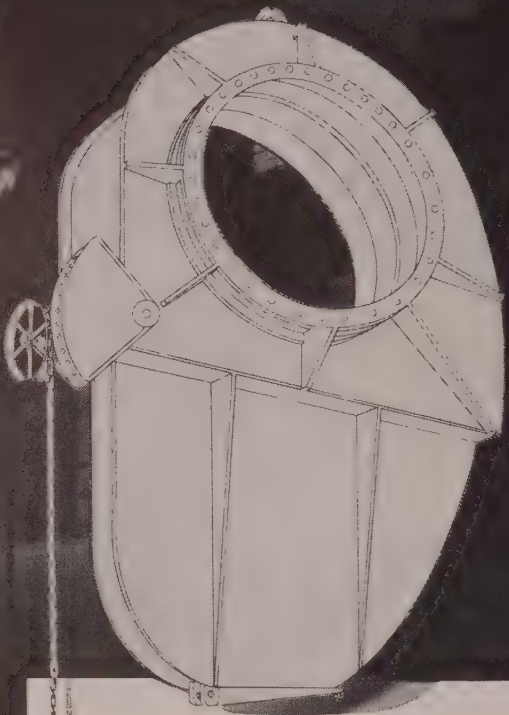
Title or Function .....

Company .....

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# positive\*



Positive action and positive seat are things you can be sure about when you specify **BROSIUS Goggle Valves** for your gas mains. And even if you only close it once a year, you can be positive that a BROSIUS valve will operate—smoothly, swiftly. BROSIUS new advanced design provides constant pressure on the valve seat open or closed, and a totally enclosed valve housing to prevent leaks to the atmosphere. Remember, the mark of BROSIUS stands for sensible blast furnace and steel mill engineering. Write to us.



Edgar E.

**BROSIUS**

Company Inc.

SHARPSBURG • PITTSBURGH 15, PA.

## Jet Caster Technique

(Concluded from Page 114)

foam in structure. Housewives can make anything from heavy beaten biscuits to angel food cake, and even popovers, by varying the fineness of their flour and the plasticity of their dough. Cokemakers have not done it as well as the housewife, but have taken the easy way by blending in the high-quality, low-volatile coals that have until the last few years been readily available. Research organizations could profitably spend a great deal more time and effort in determining the relationship of blending to coke structure.

Adequate mixer bins or coal bedding equipment, he warned, is only the first step in blending. The mixed coal must be pulverized sufficiently fine to prevent serious segregation. Hammermill pulverizing after mixing is the most practical method of preparing a good coal mix. The hammermill provided with equipment for oil treatment is another tool in the operator's hands that can be used to maintain uniform charging and prevent segregation of fine coal. After the coal is pulverized and thoroughly mixed, it should not be allowed to segregate unduly. Coal storage bins at the ovens should be provided with partitions and chutes that will minimize segregation.

Mr. Savage emphasized the importance of building new coke ovens with coal bins in mixer bins in order to practically eliminate the oven coal bin. Modern conveyor equipment is so reliable that the need of large and expensive coal bins over the ovens has become obsolete. Elimination of this large and expensive bin would not only save money, which could be better used in blending equipment, but it would practically eliminate the chance of segregation after mixing.

## Corrosion Engineers To Meet in Cincinnati

Forty-two technical papers are scheduled to be delivered at the 1949 conference of the National Association of Corrosion Engineers in Cincinnati, April 11-14. Prepared by men recognized as authorities in their respective fields, the papers will be given at 11 symposia: Corrosion principles, chemical industry, electrical and communications industries, cathodic protection, pulp and paper industry, general industry, transportation industry, protective coatings, oil industry, salt water corrosion, gas industry.

## Unit Heater Installation Simplified with

# High Lift Truck

OVERHEAD installation of unit heaters has always presented a difficult problem. The heavy units have been raised by block and tackle so that they could be fastened to the supporting fixtures. This method of elevating the heaters requires an auxiliary hook to first be placed in the ceiling to hold the block and tackle. On finished ceilings this presents a special problem because it is not always possible to install such a hook.

Unit heaters are also placed into position by being raised up to scaffolds previously built. Various methods were used, all dangerous to the workers and making slow, time-consuming jobs.

Use of a hydraulic high lift truck, supplied by Lyon-Raymond Corp., Greene, N. Y., has simplified this and other difficult installations of heavy overhead fixtures. Platform of this truck lowers to 6 inches and raises as high as 108 inches. The heavy unit can be loaded on the truck platform from the tailgate of a motor truck or, from the floor of the storage area, and wheeled to a spot directly under the place where it is to be installed. The truck is then locked into place by means of a floor lock and the fixture is raised into exact position by means of a hand or power operated hydraulic pump.



## Aluminum-Zinc Research Paper Made Available

"Colorimetric Determination of Aluminum in Zinc Base Alloys" is the subject of one of the research papers being made available to metallurgists, foundrymen, die casters and others interested in analytical problems and procedures by Silverstein & Pinsof Inc., Chicago 22. The need for a rapid and accurate procedure leads to a study of available methods. This paper describes the laboratory's experience with such methods and explains the comparative merits of the colorimetric procedure.

Detailed information is given on tests, solutions, setup and procedure with curves and a tabulation of results. A discussion of the method and a list of references are included.

## Space Heaters Installed With Combination Burners

Fuel shortages which recur in various parts of the country have resulted in an increasing number of direct-fired space heaters installed with combination burners, according to the heating section of Dravo Corp., Pittsburgh. To meet the requirements for a heater with quickly interchangeable burners for two different types of fuel, engineers of the company developed a combination unit

that is convertible from gas to fuel oil or vice versa in not more than 10 minutes. Either a light oil burner or a heavy oil burner is provided.

Bulk of the combination heater sales have been in the Midwest and accompanying states, it is reported. Although the majority of heaters have been installed in such industrial buildings as factories, foundries and machine shops, a large number have been ordered for warehouses and other classes of buildings. The combination heater is designed for a wide variety of applications and can be employed for comfort heating, process drying, tempering make-up air and heat curing. Besides its heating function, the equipment can be used during the summer for ventilating.

## Heater Cord Has New Insulation Principle

Elimination of the asbestos conventionally applied over the individual rubber insulation on heater cords is the new principle employed in the heater cord set, developed by construction materials department of General Electric Co., Bridgeport, Conn. The Preen-X heater cord is solid looking, of parallel design, with a smooth, rubber-like appearance. It has been found, under test, to eliminate kinking, to have greater abrasion resistant qualities and to be

capable of longer service life, as well as being water and oil resistant, it is stated.

Development is the outgrowth of an ignition cable developed by the company for the Army Air Force during the war. Principles used in developing the ignition cable were applied to the production of this heater cord.

## Electroplaters' Society Starts Plating Research

Research problem No. 11 on current and metal distribution in electroplating has been inaugurated by the American Electroplaters' Society at Evansville College, Evansville, Ind. Experimental work will include the electrodeposition of various common metals on a variety of standard geometric shapes of the types usually encountered in the metal forming and die casting industries, under varying current densities and bath compositions. These deposits will then be accurately measured for metal thickness.

It is hoped that the data collected in this manner will enable electroplaters to more accurately choose suitable electroplating conditions to obtain satisfactory metal distribution on complex geometric shapes. Director of the project will be Dr. John Kronsbein, head of the college's department of engineering.





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Wherever production schedules must be maintained hour after hour—24 hours a day—week after week—you'll find rugged, dependable Alliance equipment on the job. Alliance cranes—like the 15-ton double trolley, 102-foot span yard crane shown above—keep heavy industry on the move day in, day out, because they're built for long, continuous service . . . to help plants maintain smooth-flowing

production schedules at less operating cost.

Alliance' engineering specialists have designed and developed thousands of cranes to handle all types of loads . . . quickly, safely, and easily . . . in many different industries. Let Alliance—World's Largest Builder of the World's Largest Cranes—develop the equipment best suited to your company's material handling operations.

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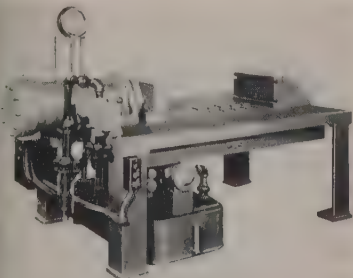
LE CRANES • GANTRY CRANES • FORGING MANIPULATORS  
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# *Alliance*

# New Products and Equipment

## Bending Press

Designed for use in bending and straightening bar, rods, light structural sections, and similar material is the 30-ton bending press, developed by R. D. Wood Co., 12 South 12th St., Philadelphia 7, Pa. Weighing approximately 6000 pounds, the heavily-constructed, self-contained press is



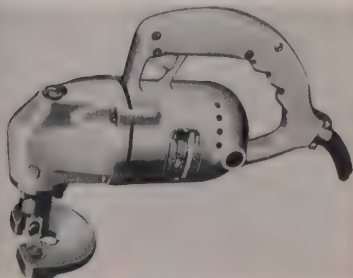
provided with a smooth tool finish work table measuring 3 x 4 feet.

Size of ram head and resistance head is 9 x 18 inches. Increments of 4 inches, from a minimum of 12 to a maximum of 36 inches, are used for adjusting distances between these heads. Hydraulic power is supplied by an electric motor-driven rotary vane type pump with a displacement of 17.1 gallons per minute at 1000 pounds per square inch. Some installations use the press mounted on end, as a vertical moving down-type press. It can be furnished in higher capacities and in table sizes to meet various requirements.

Check No. 1 on Reply Card for more Details

## Portable Shear

Capacity of the 12-gage Porto-Shear, made by Black & Decker Mfg. Co., Towson 4, Md., is 12-gage stand-



ard and sheet steel, Monel metal and stainless steel approximately two gages thinner and sheet copper, aluminum and other nonferrous metals about 50 per cent above steel rating. Light in weight, the portable shear

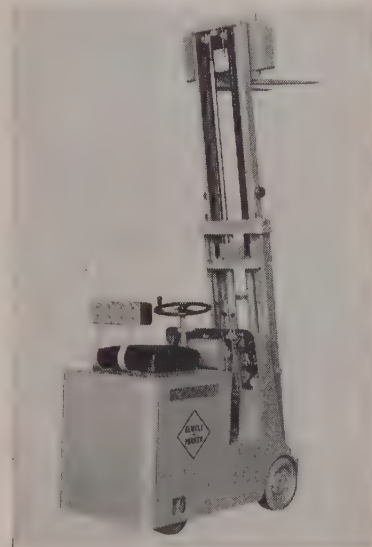
will easily follow an irregular pattern because the cutting blade is always visible and will cut on a radius as small as 1½ inches. The resulting cut is clean and smooth without burrs or ragged edges.

Shear may be held in any position. The handle contains an instant-release trigger switch with locking pin for continuous use. It is full ball-bearing equipped except for the phosphor bronze block used on the eccentric. Standard equipment includes one set of Porto-Shear blades; a set-screw wrench; and 3-wire cable and plug.

Check No. 2 on Reply Card for more Details

## Light-Weight Truck

Fast maneuvering and tiering of loads that are not excessively heavy are possible with the small, light-weight, electric power industrial



truck developed by Elwell-Parker Electric Co., Cleveland, O. Truck weighs only 4550 pounds including battery, yet can safely manipulate loads up to 2000 pounds. Overall length including a 30-inch fork is only 96 inches and width is 32½ inches, making it possible to maneuver in narrow aisles. Turning is accomplished in 60-inch intersecting aisles and in 109-inch right-angle aisles.

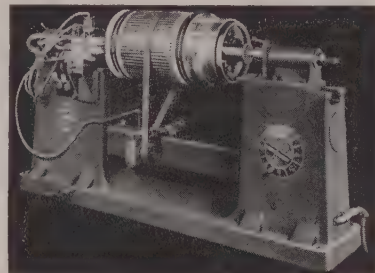
Straight travel speed with full load is 5¼ miles per hour. Maximum height of lift of fork is 121½ inches. Lifting speed loaded is at the rate of 23 feet per minute. Safety valves control lifting and lowering opera-

tions. A dual-cylinder, low-pressure hydraulic system operates the lifting mechanism. Operator can step on and off the truck from either side.

Check No. 3 on Reply Card for more Details

## Brazing Machine

Brazing and silver soldering of electric generator and armature coil ends is facilitated by a stationary brazing machine, announced by American Electric Fusion Corp., 2618 West Div-



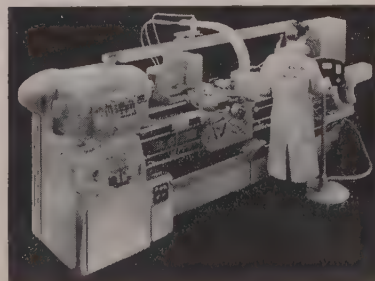
ersey Blvd., Chicago 47. It is said to eliminate guesswork, costly brazing setups and to insure uniform brazing results that meet the most rigid specifications.

It can accommodate armatures from 18 to 42 inches in diameter and with slight changes at the factory, can handle armatures of any size. It can also be used as a source of power supply for portable brazing equipment and for a number of other brazing and soldering applications. The brazing machine has a built-in heavy duty 24 kilovolt-ampere transformer with autoregulating coil and 8-point heat control selector.

Check No. 4 on Reply Card for more Details

## Lathe Tracer Attachment

Features of a flexible engine lathe—high production economies of automatic cycling and template control



of size and contour—are incorporated in a turning machine attachment known as the air-gage tracer-packaged unit, offered by Monarch Ma-



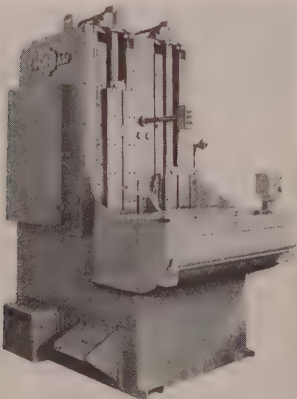
chine Tool Co., Sidney, O. The attachment is designed for application to Monarch 16 and 20-inch series 60 engine lathes, 20-inch model M, 25-inch model N and 32 inch model NN engine lathes. Reports state that it is capable of increasing production 8 to 10 times over that obtainable with conventional engine lathes.

Used with the Air-Gage tracer, development provides an individual motor drive for the lathe carriage feed. Easy selection of exact feed suited to any job and automatic cycle operation are obtained. Except for loading and unloading the machine and starting the cycle, no operator attention is required. A floor stand carrying the control panel for the unit may be positioned for operator convenience. Conversion from operation as a conventional engine lathe to automatic cycling can be made in 3 minutes or less.

Check No. 5 on Reply Card for more Details

## Broaching Machines

Designed for surface broaching, a line of dual-ram broaching machines, announced by Colonial Broach Co., Box 37, Detroit 13, Mich., is offered in nine basic sizes. Features include



new hydraulic and all-electric control systems, a cycle control system which virtually eliminates machine idle time for reloading and a forward and reverse jog cycle to simplify setting up. Machines ranging in size from 6 tons with a 42 or 54-inch stroke to 25 tons with a 42 or 66-inch stroke are manufactured.

Output efficiency is increased by having the machine continue through its next cycle if the operator has finished loading before the first cycle is completed. Increased hydraulic capacity is provided for occasional overload. Machine can be set to operate on a continuous automatic, single or semiautomatic cycle with preset con-

trol or forward or reverse jog cycle. Metered lubrication is provided once each cycle for all bearing surfaces. Coolant flow may be regulated from zero to maximum.

Check No. 6 on Reply Card for more Details

## Impact Blasting Unit

Blast cleaning of precision machine parts and holding them within tolerances as close as 0.0001-inch is possible with the hydro-finish process,



a modified form of impact blasting with an abrasive suspended in liquid, available from Pangborn Corp., Hagerstown, Md. There is no breakdown of sharp edges and corners and the resulting finish is nondirectional. Delicate instruments and fragile materials may be cleaned and polished successfully.

Process is accomplished in a watertight cabinet provided with a hopper tank for mixing, storing and recollecting the suspension. A circulating pump delivers the liquid to the blasting nozzle. Velocity is attained by an injection of compressed air. Material as fine as 5000 mesh may be used. Hydro-finish cabinets are offered in four sizes.

Check No. 7 on Reply Card for more Details

## Laboratory Oven

Harry W. Dietert Co., Detroit 4, Mich., is introducing the Speed Oven, a laboratory unit which has a drying space of 8 inches in diameter and 6 inches in height. Overall height of the unit is 29 inches and power requirements are 2800 watts at 115 or 230 volts.

A motor driven fan forces filtered

air past electric heating elements. Air temperature is thermostatically controlled at any chosen drying temperature between 150 and 350° F. Heated air flowing against and past the sample rapidly picks up the moisture or volatile material, obtaining a rapid drying rate. A 3-inch diameter atmosphere exhaust connection is provided so that the heated air and any fumes may be piped to an exhaust hood or duct.

Check No. 8 on Reply Card for more Details

## Live Center

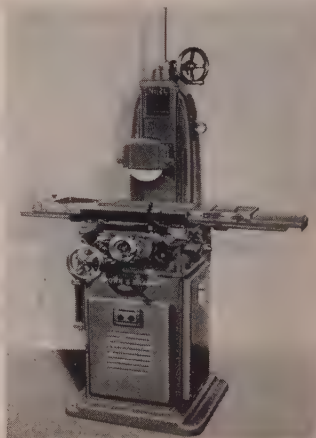
Strength and rigidity required for heavy roughing cuts and accuracy for fine work and high speed are combined in the ball bearing live center for lathes, manufactured by South Bend Lathe Works, 390 E. Madison St., South Bend, Ind. The revolving center is made from electric furnace tool steel heat treated to a hardness of 61 to 65 rockwell C. The center point shaft extends through the taper shank and is supported by bearings at both ends.

A precision ball bearing carries both radial and thrust loads and center point whip is eliminated by a rear pilot bearing. All parts are interchangeable and replaceable. Smaller of the two sizes available has a No. 2 Morse taper shank and the larger a No. 3 Morse taper shank.

Check No. 9 on Reply Card for more Details

## Grinding Machines

Designed for exceedingly dusty or severe operating conditions, the No. 2L and 2LB surface grinding machines, built by Brown & Sharpe Mfg.



Co., Providence 1, R. I., are offered with drive from motor in the base or with motorized spindle. The No. 2L machine has automatic feeds and the No. 2LB machine has hand feeds only. Both have full automatic lu-

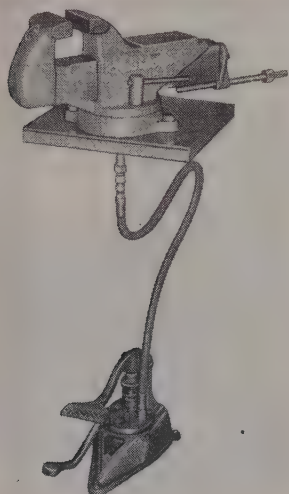
lication provided for all moving parts and surfaces.

Table sliding surfaces are guarded from abrasive dust. Work measuring 18 inches long, 6 inches wide and 9½ inches high may be ground, using a 7-inch diameter wheel. Vertical adjustment of wheel spindle slide is 10 inches. Plain and antifriction bearing spindle units are available. Full load spindle speed is 3200 revolutions per minute. Table speed of 19 or 31 feet per minute is selected by a lever.

Check No. 10 on Reply Card for more Details

## Hydraulic Vise

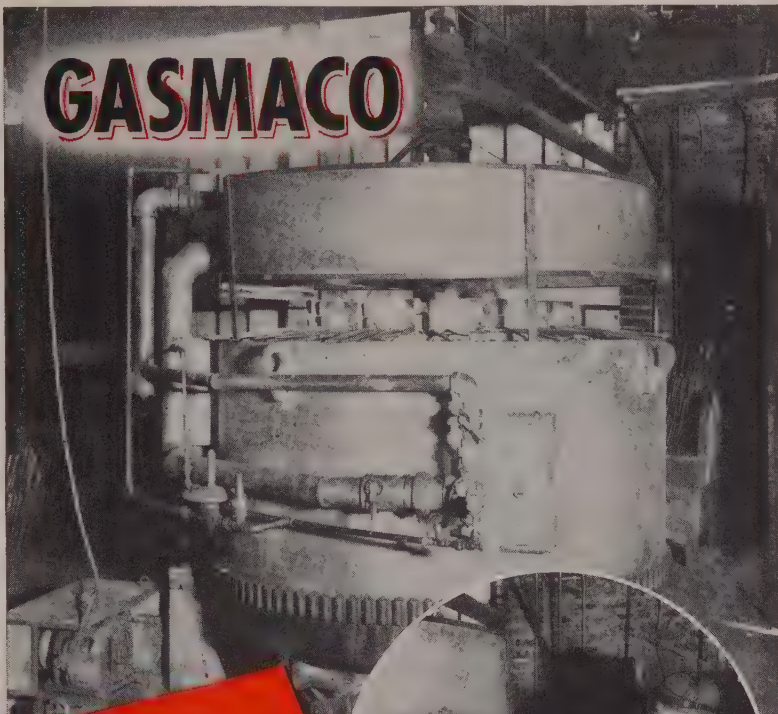
Besides enabling an operator to perform work with both hands, latest foot-operated, hydraulic swivel type machinists vise announced recently by Columbian Vise & Mfg. Co., 9017 Bessemer Ave., Cleveland 4, pro-



vides features that allow a worker to control both speed and gripping pressure of the unit at all times.

Dependable "feather" control of the vise makes it suitable for applications involving light castings and finished surfaces where gripping without crushing or marring is desirable. Any pressure up to 6000 psi enables it to cope with tough jobs requiring high gripping pressure.

As shown, hydraulic power component of the bench vise located on the floor is convenient to the operator's feet. Alternate operation of two foot pedals enables operator to either close or open the vise jaws. The power pedal operating the 2-stage hydraulic pump—larger of the two—does not slam the vise jaws together upon actuation, but moves the front jaw to gripping position in



**THE RIGHT  
FURNACE**

*for the right job!*

Perfect timing and uniform heating are two important factors governing low-cost, increased production at The American Fork & Hoe Company's plant in Ashtabula, O.

The Gas Machinery Company of Cleveland designed and installed a special oil-fired Rotary Hammer Welding furnace, carrying thermal head upwards of 2900° F. to heat work to 2300° F. at high speed.

The unit provides fast, localized heating, which is a must in the split-second heating process necessary in this continuous operation.

GASMACO engineers have the right furnace for increased, economical production for you.

**THE GAS MACHINERY COMPANY**

16116 WATERLOO ROAD  
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Designers Fabricators Erectors  
Gas Plant Equipment and  
Industrial Furnaces



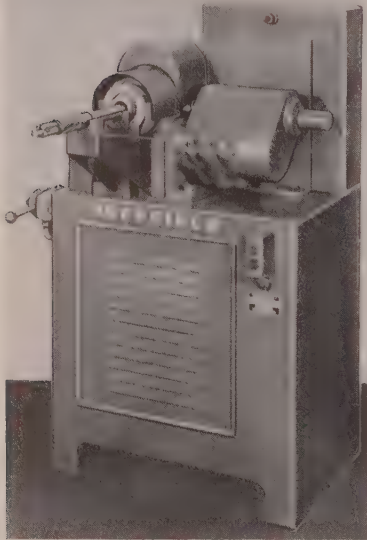
short movements. Only eight strokes of the power pedal are necessary to close the jaws from full open position. Smaller pedal releases the jaws at a steady rate as long as it is depressed. Opening travel can be stopped in any position by simply removing pressure from the pedal. The vise is opened automatically by pressure of an oversize coil spring incorporated inside the vise itself.

Jaw opening of the vise is 6 inches, its jaw width is 3½ inches. Other features include a swivel base, and an adjustable stop control located in the rear that enables unit to be used on the production line where repetitive work is required.

Check No. 11 on Reply Card for more Details

## Spline Burring Machine

A flytool machine that can burr a spline where the adjacent shaft diameter approaches the root diameter of the spline is the spline burr-



ing machine manufactured by Sheffield Corp., Dayton 1, O. While primarily a single purpose device for spline burring of either involute or straight spline, it can handle more than one size—provided the parts lend themselves to the general specifications of the machine. An average of 10 tooth splines can be burred in approximately 3 seconds.

In operation the part is placed in a receiver and the hand or air-operated clamping device forces the part into a rotating spline collar and forward against a positive stop. Part and cutter are timed together, the flytool passing through the spline tooth, chamfers a 30 to 40 degree angle on each side of the tooth. In

many cases splines may be chamfered in the root as well as on the sides. After the part has made a complete revolution, the operator is signaled by a light. He then unclamps the part and it is ejected by a spring collar.

Check No. 12 on Reply Card for more Details

## Thread Roller

Application of thread rolling to 4-inch diameter threads is noted in A32 cylindrical die thread roller announced by Reed Rolled Thread Die Co., 237 Chandler St., Worcester 2, Mass. In the thread roller the work



blank is supported and positioned horizontally between three synchronously rotating cylindrical dies. They act on the blank simultaneously and hold it rigidly in proper rolling position.

Rolling pressure causes the material to follow the pattern of the dies which always remain in match during rolling. Control of work dimensions is by adjustments for diameter, length and taper. Adjustable scroll rings provide for approximate setting of the dies, while final sizing is obtained by micrometer adjustment. Machine has a thread capacity of ⅝ to 4-inch diameters and five standard die speeds ranging from 115 to 640 revolutions per minute. Seven standard work cycles range from 2 to 26 per minute.

Check No. 13 on Reply Card for more Details

## Power Press Brakes

Columbia Machinery & Engineering Corp., Hamilton, O., has expanded its line of power press brakes to include a range of sizes from 120 to 900 tons. The range will form mild steel ⅝ to 1 inch thick in lengths from 4 to 20 feet. All sizes except the 120-ton model employ twin-drive main gears. Back gears operate in oil within an oil-tight case. All have motor-driven slide-adjustments with micrometer

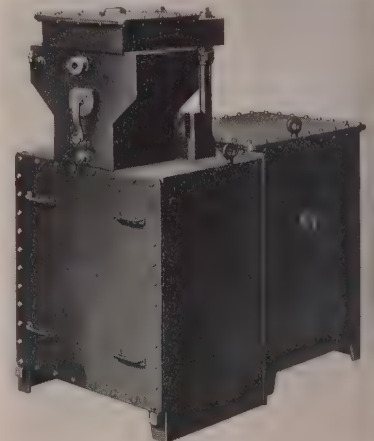
controls, motor and control being readily accessible to the operator.

Presses have manually operated, multiple disk friction clutch. High-efficiency drum type friction brake quickly stops and holds the slide at any point of the stroke. All models are constructed of heavy rolled steel plate, arc welded, to provide a maximum deflection of 0.001-inch per foot of machine width. Lubrication of all main bearings is through a centralized system. Standard bending and forming dies, die blocks and tool holders can be furnished. All models can be equipped with removable wide tables for use with wide dies or special punching setups.

Check No. 14 on Reply Card for more Details

## Combination Starter

For use in class I, group D hazardous locations, is the Valimotor combination starter with self-contained disconnect switch, developed by Electric Controller & Mfg. Co., 2700 East 79th St., Cleveland 4, O.



for squirrel-cage, synchronous and wound-rotor motors of 2300 to 4600 volts. It provides unlimited short circuit protection and, regardless of the available kilovolt-amperes of the power system, a fault current in the motor circuit is limited to 25,000 kilovolt-amperes. The type ZHS magnetic contactor of 50,000 kilovolt-amperes interrupting capacity is more than ample to clear the circuit.

An oil disconnect switch permits isolating the starter from power lines. The ZHS contactor is mounted in the rear oil tank. In the front compartment is the overload relay panel which gives inverse time element protection for prolonged overloads and trips instantly on short circuits. Starters are built for motors up to 600 horsepower at 2300 volts and 4600 volts, 60 cycle service.

For 25 cycle power circuits, the maximum rating is 300 horsepower at 2300 volts and 250 horsepower at 4600 volts.

Check No. 15 on Reply Card for more Details

## Powder Metal Press

Smoother action, provided through the use of air cylinders in place of springs for holding rocker arm or both upper and lower cams, shaker cams and core rod cams, is one of



the design changes in the P-3 cam-type powder metal press, designed by F. J. Stokes Machine Co., 5900 Tabor Rd., Philadelphia 20, Pa. Use of twin disk clutch and brake help take the load off the motor, since the flywheel is allowed to come up to full speed before the clutch engages. This also permits adjustment of punches and dies while the flywheel is running.

Press core rods have been strengthened to take up to 15 tons as a movable core rod and 30 tons as a stationary core rod. Addition of a high slip motor, coupled with the heavier flywheel, has permitted a reduced motor size. Other improvements include provision for hydraulic release on the upper punch, steel cam blocks bolted on cam bodies by bolts coming from underneath so that the cam face presents a smooth unbroken surface.

Check No. 16 on Reply Card for more Details

## Wheel Presses

Hydraulic Press Mfg. Co., Mount Gilead, O., is producing a line of self-contained hydraulic wheel presses with capacities from 50 to 600 tons. Such a press may be used to facilitate ease and speed in assembling or removing wheels, pulleys, gears, etc. Remote pushbutton operating control, mounted on a swinging arm, enables the operator to control press ram

movement from the most advantageous position.

Resistance yoke of the press is equipped with a stop block which is used for contacting the end of axles when mounting wheels. A throat block is provided on the end of the ram for clearing axle when forcing on wheels. A variable delivery oil hydraulic pump with direct electric motor drive and a booster unit which doubles the normal pressure generated by the variable delivery pump assure a smooth uniform pressure.

Check No. 17 on Reply Card for more Details

## Stacking Hand Truck

Built to permit passage through standard 7-foot factory doors and to utilize full use of storage facilities is the new tilting type Transtacker, announced by Automatic Transporta-



tion Co., 149 West 87th St., Chicago, Ill. This light weight battery-operated hand truck is available in two models, single lift model SCL and telescopic model SCLT. The 21 degree backward tilt is sufficient for safe load cradling and 5 degree forward tilt simplifies load-spotting.

Weight of the SCL model with standard 11-plate battery is 3400 pounds, permitting use in elevators and factories where floor capacities are limited. The SCLT weight is 4000 pounds. Single lift of model SCL is 64 inches, while the SCLT unit has a lift of 120 inches. Capacity of the telescopic unit is 3100 pounds for a load 28 inches long or 2100 pounds for a 48-inch load.

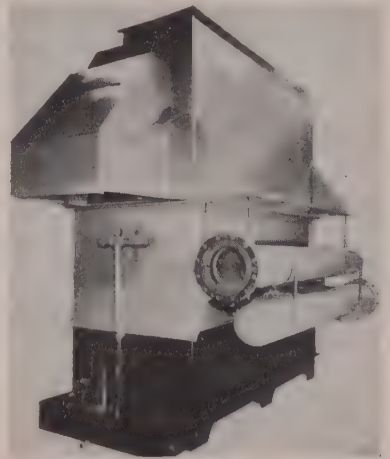
Check No. 18 on Reply Card for more Details

## After Cooler

Niagara Blower Co., 405 Lexington Ave., New York 17, N. Y., is introducing Aero After Cooler, which is protected from freezing in outdoor in-

stallations. This equipment dehydrates compressed air or gas by cooling it to a temperature below the dry bulb temperature of the atmospheric air, thereby removing the moisture that condenses at that point and preventing further condensation of water in air or gas lines in use.

Production against freezing is given by the use of the "balanced-wet-bulb" control. A thermostat in the



spray water reservoir is set for a desired low temperature limit at which it operates dampers to recirculate the air stream internally around a division plate instead of drawing in freezing air. This permits outdoor installations to save space and to give the benefit of the lowest wet bulb temperature in summer. Prevention of condensation in air line saves water damage to air tools, paint sprays or materials in process.

Check No. 19 on Reply Card for more Details

## Selenium Rectifier

Charging of 15, 16 or 18-cell lead batteries or 20 to 24-cell Edison batteries, of the type commonly used in electric trucks, may be carried out with selenium rectifiers being marketed by Fansteel Metallurgical Corp., North Chicago, Ill. Rectifier stacks and other component parts are built to withstand heavy duty service. In charging lead batteries, a two-rate method is used. Charging begins at a high rate and when the finish charge should begin an Exide TVR relay operates, inserting resistance into direct current charging circuit. The duration of the finish charge is determined by the electric time switch.

At the conclusion of the cycle the battery is disconnected from the rectifier and the alternating current supply line is disconnected automatically.

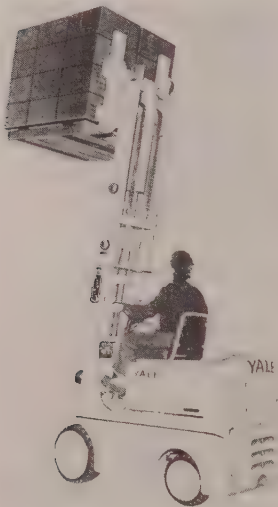


Edison batteries, charged at an almost constant rate for the entire period, are also automatically disconnected when the charge is completed. Indicator lamps show that the right supplier is in operation and an ammeter and a voltmeter give visual indication of charging rate.

Check No. 20 on Reply Card for more Details

## Gas Lift Truck

Equipped with standard Chrysler fluid drive, the gas-powered Lift King truck, first such unit developed by Yale & Towne Mfg. Co., Philadelphia, Pa., permits the operator to progress from slow to fast speeds, and vice versa, without operating clutch or



gearshift levers. Hydraulic lift is actuated by a ram within a ram which gives two stages of elevation. All hydraulic connections are placed to prevent hose lines from dangling from the elevated mast. Loading, clamping, rotating and fork-adjusting accessories for the truck operate hydraulically.

Free lift is 66 inches and maximum lifting height is 130 inches. Loads up to 6000 pounds may be handled. A second model has a 51-inch free lift, maximum lifting height of 100 inches and collapsed height of 68 inches. Control is of the automotive type and lifting speeds range up to 30 feet per minute at full load. Other features include a 6-cylinder Chrysler engine and shockproof steering.

Check No. 21 on Reply Card for more Details

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**PLATFORM TRUCK:** Designated as the Freighter, a new platform truck is announced by Rapids-Standard Co. Inc., Grand Rapids 2, Mich. It is

available in seven platform sizes with either Rapid-Flame hardened micro-steel, molded-on cushion rubber, or Durastan resinoid wheels.

Check No. 22 on Reply Card for more Details

**SAFETY DEVICE:** Micro Switch, Freeport, Ill., offers a new two-hand, easy to operate, electrical device for safe control of tripping mechanisms on punch presses, riveting machines, shears, spot welders and air presses.

Check No. 23 on Reply Card for more Details

**HACKSAW FRAME:** A new hacksaw frame that features novel lever action which applies greater and more uniform tension on blades and allows faster blade changes is offered by Millers Falls Co., Greenfield, Mass.

Check No. 24 on Reply Card for more Details

**BATTERY CHARGER:** An automatic single-circuit, motor-generator battery charger for motive power batteries, known as Charg-O-Matic, is announced by Hertner Electric Co., Cleveland, O. The portable unit is furnished as a complete package unit and occupies less than 4 square feet of floor space.

Check No. 25 on Reply Card for more Details

**JACK:** A new Simplex Cramer-type push-and-pull jack introduced by Templeton, Kenly & Co., Chicago, is designed for safer and faster lining of piles, general heavy construction work, trestle bridges and all types of push and pull jacking jobs in construction and railroad work. It is available in two models.

Check No. 26 on Reply Card for more Details

**GAS FLOW METER UNIT:** To assure maximum efficiency with proper flame balance, higher spraying speeds and gas savings in operation of metallizing guns, Metallizing Engrg. Co., Inc., Long Island City, N. Y., introduces Metco type GF gas flow meter unit.

Check No. 27 on Reply Card for more Details

**AIR DRYERS:** Anders Co., New York 17, N. Y., offers a line of fully automatic compressed air dryers. The units are made in nine standard models with capacities from 15 to 750 cubic feet per minute based on conditions of 100 pounds pressure and 70° F.

Check No. 28 on Reply Card for more Details

**SYNTHETIC RESIN:** For fast drying enamels, a new type of synthetic

resin has been developed by American Cyanamid Co., New York 20, N. Y. Known as Cycopol, it is specially adapted for use in industrial finishes and fast drying household enamels.

Check No. 29 on Reply Card for more Details

**RECTIFIER:** A 2500-ampere low voltage industrial rectifier offered by Mellaphone Corp., Rochester 2, N. Y., is useful as a source of energy for electroplating, anodizing, electrolytic water treatment and for replacing batteries and production testing.

Check No. 30 on Reply Card for more Details

**ROLL HANDLING TRUCK:** A heavy duty roll handling truck was developed by Ironbound Box & Lumber Co., Hillside, N. J., to handle double rolls of wallpaper but its special design makes it well adapted to handle products with comparatively small diameters and lengths not exceeding 5 feet.

Check No. 31 on Reply Card for more Details

**PURGE METER:** Gas or liquid purge rates can be measured in cubic feet per hour of air or gallons per hour of water by the new purge meter available from Fischer & Porter Co., Hatboro, Pa. It is an adaptation of the Flowrator instrument and includes a built-in needle valve for close control of purge rates.

Check No. 32 on Reply Card for more Details

**THERMOMETER:** A heavy duty, dial type thermometer is announced by Qualitrol Corp., East Rochester, N. Y. There are seven temperature ranges from minus 90 to 1000 degrees F; dial sizes are 2, 3 and 5 inches.

Check No. 33 on Reply Card for more Details

**ELECTRIC DRILL:** A pistol-grip type electric drill is offered by Milwaukee Electric Tool Corp., Milwaukee, Wis. It is available in three different drill size capacities and five different rated speeds: 3/8-inch at 650 revolutions per minute, 5/16-inch at 1000 revolutions per minute, and 1/4-inch at 2000, 3500 and 5000 revolutions per minute.

Check No. 34 on Reply Card for more Details

## FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention

**SUPPLY-DEMAND**—Balance in the major steel products still is months distant with consumers continuing to seek far more tonnage than the mills can furnish promptly.

While manufacturing operations have been slipping in some areas of the consuming field this has not yet been reflected in any appreciable slackening of demand at the mill level, especially in sheet, strip, plates, shapes, bars and pipe. Alloy steels and specialties are in easier supply, and pressure is off the gray market and is easing on conversion steel, but overall market conditions remain much the same as for a long time past.

**OUTLOOK**—Reported lessening demand has brought considerable disappointment to many buyers who continue to find steel rolling schedules as jammed as ever. Cancelled tonnage, chiefly from the lighter manufacturing lines, is so quickly replaced open time on rolling schedules is virtually non-existent in the major products. In this connection it is pointed out by the steelmakers that while potential demand is lessening there is still a heavy cushion of unfilled requirements, especially those related to long-range programs in heavy durable lines. Also, they emphasize, inventories at many manufacturing plants are a long way from being in proper balance. As a result, it is felt that despite the soft spots which have appeared it will be well past midyear before steel will be in substantially freer supply than at present.

**CAUTION**—So long as consumer inventories remain depleted and manufacturing operations continue at the current high level, it is unlikely a severe break in demand for steel will be experienced. However, with the mills pouring out metal at capacity pace and supply pipelines filling in various directions there is little question steel supply will progressively ease as months pass. With worker layoffs at industrial and railroad shops continuing, industrial

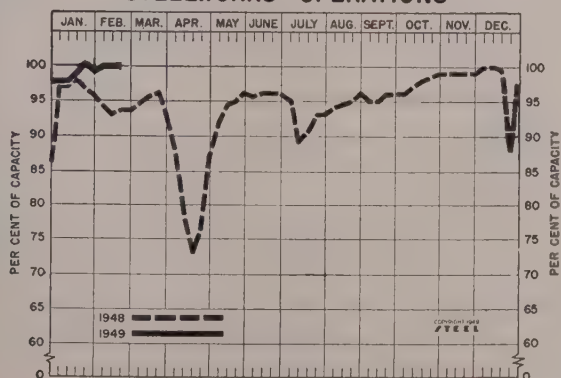
construction lagging, foundry activity curtailed and the scrap market displaying severe weakness, there is every reason to expect buyers will increasingly lean toward the conservative side in covering their requirements. This, in due time, should be reflected in steel order volume. In fact, some observers think accumulation of steel stocks by consumers, as is indicated currently, could cause, at some unpredictable future date, a flood of mill order cancellations.

**PRICES**—Increasing resistance to premium prices is noted. Gray market operators are having a difficult time finding buyers for their offerings even at sharply reduced prices. Interest in high-priced conversion tonnage is lagging though considerable such steel is still moving on old arrangements. For the most part mill prices are firm at levels established months ago, but it is apparent they are under growing pressure. For example, reflecting sagging demand for special steels, a leading producer of silicon sheets and strip last week cut prices \$50 per ton on motor and dynamo grades, and \$35 per ton on transformer grades.

**COMPOSITES**—Continued weakness in scrap is reflected in a further drop in STEEL's arithmetical price composite to \$38.17 from \$38.83 a week ago, and \$43.25 at the end of last year. The situation in this market is extremely confused with buying limited and dealers' offerings going begging at prices below the last representative market sale. Other composites are unchanged from a week ago with finished steel at \$97.77, semifinished steel, \$75.75 and steel-making pig iron, \$46.22.

**PRODUCTION**—Steelmaking facilities continued to operate at full capacity last week, the estimated national ingot rate holding at 100 per cent. This is equivalent to production of 1,943,500 net tons of ingots and castings.

### STEELWORKS OPERATIONS



### DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Feb. 19	Change	Same Week 1948	1947
Pittsburgh	97.5	None	91	99
Chicago	98	- 2	92.5	92
Eastern Pa.	97	None	91	89
Youngstown	105	None	102	89
Wheeling	92.5	- 2	90	87.5
Cleveland	100.5	+ 4.5	95	93
Buffalo	104	None	86	90.5
Birmingham	100	None	100	99
New England	89	None	83	92
Cincinnati	103	+ 1	90	96
St. Louis	89.5	None	82.5	69
Detroit	106	None	89	92
Estimated national rate	100	None	93.5	94.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947.



# COMPOSITE MARKET AVERAGES

## Arithmetical Price Composites\*

	Feb. 19	Feb. 12	Jan. 1949	Feb. 1949	5 Years Ago
Finished Steel .....	\$97.77	\$97.77	\$97.75	\$79.86	\$56.73
Semifinished Steel .....	75.75	75.75	75.75	67.16	36.00
Steelmaking Pig Iron .....	46.22	46.22	46.26	39.30	23.00
Steelmaking Scrap .....	38.17	38.83	41.54	40.48	19.17

\* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods, on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; black drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. January, 1949, figure is preliminary.

## FINISHED STEEL WEIGHTED COMPOSITE†

Jan. 1949 .....	4.20563c
Dec. 1948 .....	4.14190c
Nov. 1948 .....	4.11778c
Jan. 1948 .....	3.49997c
Jan. 1944 .....	2.41455c

## COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

### Finished Materials

	Feb. 19, 1949	Jan. 1949	Nov. 1948	Feb. 1948
Steel bars, Pittsburgh mills.....	3.45c	3.45c	3.45c	2.90c
Steel bars, del. Philadelphia .....	3.8164	3.8094	3.79	3.356
Steel bars, Chicago mills.....	3.35	3.35	3.35	2.90
Shapes, Pittsburgh mills .....	3.275	3.275	3.275	2.80
Shapes, Chicago mills .....	3.25	3.25	3.25	2.90
Shapes, del. Philadelphia .....	3.4918	3.4888	3.48	2.968
Plates, Pittsburgh mills .....	3.50	3.50	3.50	2.95
Plates, Chicago mills .....	3.40	3.40	3.40	2.95
Plates, del. Philadelphia .....	3.7256	3.7217	3.71	3.19
Sheets, hot-rolled, Pittsburgh mills.....	3.275	3.275	3.275	2.80
Sheets, cold-rolled, Pittsburgh .....	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Pittsburgh.....	4.40	4.40	4.40	3.95
Sheets, hot-rolled, Gary mills.....	3.25	3.25	3.25	2.80
Sheets, cold-rolled, Gary mills.....	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Gary mills.....	4.40	4.40	4.40	3.95
Strip, hot-rolled, Pittsburgh mills.....	3.275	3.275	3.275	2.925
Strip, cold-rolled, Pittsburgh mills.....	4.375	4.375	4.375	3.675
Bright basic, wire, Pittsburgh .....	4.325	4.325	4.325	3.775
Wire nails, Pittsburgh mills.....	5.775	5.775	5.775	4.95
Tin plate, per base box, Pitts. dist.	\$6.70	\$6.80	\$6.80	\$6.70

### Pig Iron

	Feb. 19, 1949	Jan. 1949	Nov. 1948	Feb. 1948
Bessemer, del. Pittsburgh (N.&S. sides)	\$48.08	\$48.08	\$48.08	\$40.996
Basic, Valley .....	46.00	46.00	46.00	39.00
Basic, eastern del. Philadelphia.....	50.3002	50.2876	50.17	42.004
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	40.495
No. 2 fdry., del. Philadelphia .....	50.8002	50.7676	50.67	42.504
No. 2 foundry, Chicago .....	46.25	46.25	46.25	39.00
No. 2 foundry, Valley .....	46.50	46.50	46.50	39.50
Southern No. 2 Birmingham .....	43.38	43.38	43.38	37.88
Southern No. 2 del. Cincinnati .....	49.43	49.35	49.09	40.74
Malleable, Valley .....	46.50	46.50	46.50	39.50
Malleable, Chicago .....	46.50	46.50	46.50	39.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	55.00
Ferromanganese, f.o.b. Etna, Pa. ..	163.00	163.00	163.00	151.00

\* F.o.b. cars Pittsburgh.

### Scrap

Heavy melt, steel, No. 1, Pittsburgh	\$39.00	\$41.90	\$42.75	\$40.44
Heavy melt, steel, No. 2, E. Pa. ..	35.00	40.00	41.50	39.125
Heavy melt, steel, No. 1, Chicago ..	36.00	39.38	41.75	39.125
Heavy melt, steel, No. 1, Valley ..	37.75	39.75	42.75	40.25
Heavy melt, steel, No. 1, Buffalo ..	39.50	45.88	48.50	43.63
Heavy melt, steel, No. 1, Buffalo ..	40.50	45.88	48.50	43.63
Rails for rerolling, Chicago.....	48.00	59.38	69.50	51.00
No. 1 cast, Chicago .....	44.00	58.38	70.50	66.00

### Coke

Connellsville, beehive furnace .....	\$14.50	\$14.50	\$14.50	\$12.50
Connellsville, beehive foundry .....	17.00	17.00	17.00	14.78
Chicago, oven foundry, ovens.....	20.40	20.40	20.40	18.00

### Semifinished

Sheet bars, mill .....	\$67.00*	\$67.00*	\$67.00*	\$56.79
Slabs, Chicago .....	52.00	52.00	52.00	42.59
Re-rolling billets, Pittsburgh .....	59.00	59.00	59.00	42.59
Wire rod $\frac{3}{8}$ to $\frac{1}{2}$ -inch, Pitts. dist. ..	3.775c	3.775c	3.775c	3.175c

\* Nominal.

## FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

### Semifinished Steel

**Carbon Steel Ingots:** Re-rolling quality, standard analysis, open market, \$100-\$105 per gross ton. Forging quality, \$50 per net ton, mill.

**Alloy Steel Ingots:** \$51 per net ton, mill.

**Re-rolling Billets, Blooms, Slabs:** \$52 per net ton, mill, except: \$62, Conshohocken, Pa.; \$66, Monessen, Pa.; sales by smaller interests on negotiated basis at \$85 per gross ton, or higher.

**Forging Quality Billets, Blooms, Slabs:** \$61 per net ton, mill, except: \$68, Conshohocken, Pa., mill.

**Alloy Billets, Slabs, Blooms:** Re-rolling quality, \$63 per net ton, mill, except: \$70, Conshohocken, Pa.

**Sheet Bars:** \$87 nom., per net ton, mill; sales in open market \$110-\$115 per gross ton.

**Skelp:** 3.25c per lb, mill.

**Tube Rounds:** \$76 per net ton, mill; some sellers quoting up to \$120 per gross ton.

**Wire Rods:** Basic and acid open-hearth, 7/32 &  $\frac{1}{2}$ -inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburgh, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c Monessen, Pa. One producer quotes 3.90c, Chicago base.

Basic open-hearth and bessemer, not resulfurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

### Bars

**Hot-Rolled Carbon Bars (O.H. only; base 20 tons):** 3.35c, mill, except: 3.55c, Ecorse, Mich., Pittsburgh, Monessen, Alliquippa, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif., Portland, Oreg., Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 4.40c, Atlanta; 5.30c, Fontana, Calif.

**Rail Steel Bars (Base 10 tons):** 3.35c, Moline, Ill., 5.10c, Williamsport, Pa.; another interest quotes 5.35c, mill.

**Hot-Rolled Alloy Bars:** 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

**Cold-Finished Carbon Bars (Base 40,000 lb and over):** 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.50c, Camden, N. J.; 5.30c, Los Angeles.

**Cold-Finished Alloy Bars:** 4.65c, mill, except: 4.75c, Monessen, Pa.; 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford.

**High-Strength, Low-Alloy Bars:** 5.10c, mill, except 5.30c, Youngstown; 5.40c, Ecorse, Mich.

**Reinforcing Bars (New Billet):** 3.35c, mill, except: 3.55c, Monessen, Pa.; 4.05c, Pittsburgh, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

**Reinforcing Bars (Rail Steel):** 4.65c, Williamsport, Pa., mill; another interest quotes 5.35c, mill.

**Wrought Iron Bars:** Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa., 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

### Sheets

**Hot-Rolled Sheets (18 gage and heavier):** 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburgh, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.55c, Fontana, Calif.; 6.25c, Kansas City, Mo.

**Hot-Rolled Sheets (19 gage and lighter, annealed):** 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O.; 5.05c, Torrance, Calif., Kokomo, Ind.

**Cold-Rolled Sheets:** 4.00c, mill, except: 4.20c, Ecorse, Mich.; 4.70c, Granite City, Ill.; 4.95c, Pittsburgh, Calif.

**Galvanized Sheets, No. 10:** (Based on 5 cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburgh, Torrance, Calif.; 5.30c, Kokomo, Ind.

**Galvannealed Sheets:** 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.55c, Niles, O.; 5.70c, Kokomo, Ind.

**Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc):** 5.00c, mill, except: 5.40c, Granite City, Ill.; 5.45c, Kokomo, Ind.; 5.75c, Pittsburgh, Torrance, Calif.

**Long Terns, No. 10 (Commercial quality):** 4.80c, mill.

**Enameling Sheets, No. 12:** 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.; 6.00c, Niles, O.

**Silicon Sheets, No. 24:** Field: 5.15c, mill, Armature: 5.45c, mill, except: 5.95c, Warren, O.; 6.05c, Niles, O.

**Electrical:** Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.; 6.55c, Niles, O.

**Motor:** 6.70c mill except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.; 7.95c, Follansbee, W. Va., Toronto, O.

**Dynamo:** 7.50c, mill, except: 8.65c, Follansbee, W. Va., Toronto, O.; 7.70c, Granite City, Ill.

**Transformer 72, 8.05c, mill, except: 9.15c, Follansbee, W. Va., Toronto, O.; 10.05c, Brackenridge, Pa.; 65, 8.60c, mill, except: 9.85c, Follansbee, W. Va., Toronto, O.; 10.60c, Brackenridge, Pa.; 58, 9.30c, mill except: 10.55c, Follansbee, W. Va., Toronto, O.; 11.30c, Brackenridge, Pa.; 52, 10.10c, mill, except: 11.35c, Follansbee, W. Va., Toronto, O.**

**High-Strength Low-Alloy Sheets:** Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 6.25c, Ecorse, Mich., and Conshohocken, Pa., mills.

**Galvanized (No. 10):** 6.75c, mill.

**Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich.**



## Strip

**Hot-Rolled Strip:** 3.25c mill, except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-3.35c,\* Sharon, Pa.; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Atlanta; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburgh, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 4.20c, Kansas City, Mo.; 4.30c, Minnequa, Colo.; 5.90c Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

\* Wider than 6-in. and 6-in. and narrower respectively.

**Cold-Rolled Strip** (0.25 carbon and less): 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.00-4.50c, Youngstown; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.80-5.05c, Wallingford, Conn.; 5.75c, Los Angeles; 7.10c, Fontana, Calif. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

**Cold-Finished Spring Steel:** 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.50c, New Castle, Pa., Boston; Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill, except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton, N. J.

**Cold-Rolled Alloy Strip:** 9.50c, mill except: 9.80c, Worcester, Mass.

**High-Strength, Low-Alloy Strip:** Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich., mill.

## Tin, Terne Plate

**Tin Plate:** American Coke, per base box of 100 lb, 1.25 lb coating \$7.50-\$7.70; 1.50 lb coating \$7.75-7.95. Pittsburgh, Calif., mill \$8.25 and \$8.50, respectively, for 1.25 and 1.50 lb coatings.

**Electrolytic Tin Plate:** Per base box of 100 lb, 0.25 lb tin, \$6.45-6.65; 0.50 lb tin, \$6.70-\$6.90; 0.75 lb tin, \$7.00-\$7.20.

**Can Making Black Plate:** Per base box of 100 lb, 55 to 128 lb basis weight \$5.75-\$5.85. Pittsburgh, Calif., mill, \$6.50.

**Holloware Enameling Black Plate:** 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

**Manufacturing Termes (Special Coated):** Per base box of 100 lb, \$6.65, except: \$6.75 Fairfield, Ala., Sparrows Point, Md.

**Roofing Termes:** Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, \$15.50.

## Plates

**Carbon Steel Plates:** 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.60c, Pittsburgh; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston, Tex.; 5.80c, Fontana, Calif.; 6.50c, Harrisburg, Pa.; 6.25c, Kansas City, Mo.

**Floor Plates:** 4.55c, mill.

**Open-Heath Alloy Plates:** 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

**High-Strength, Low-Alloy Plates:** 5.20c mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.40c, Youngstown; 5.65c, Ecorse, Mich., Sharon, Pa.

## Shapes

**Structural Shapes:** 3.25c, mill, except: 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Alliquippa, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif. Alloy Structural Shapes: 4.05c, mill.

**High-Strength, Low-Alloy Shapes:** 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Youngstown.

## Wire and Wire Products

**Wire to Manufacturers (carloads):** Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Monessen, Pa.; Minnequa, Colo., Atlanta, Buffalo; 4.70c, Portsmouth, O.; 4.80c, Palmer, Mass.; 5.10c, Pittsburgh, Calif.; 5.15c, S. San Francisco; 5.40c, Shelton, Conn. One producer

quotes 4.50c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

**Basic MB Spring Wire:** 5.55c, mill, except: 5.30c, Portsmouth, O.; 5.65c, Sparrows Point, Md., Monessen, Pa.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburgh, Calif. Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburgh, Calif.

**Wire Products to Trade (carloads): Merchant Quality Wire: Annealed** (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md.; 4.95c, Monessen, Pa.; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo., Kokomo, Ind.; 5.20c, Atlanta; 5.75c, S. San Francisco, Pittsburgh, Calif. One producer quotes 5.15c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

**Galvanized** (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md.; 5.40c, Alliquippa, Monessen, Pa.; 5.55c, Worcester, Mass.; 5.60c, Kokomo, Ind., Minnequa, Colo.; 5.65c, Atlanta; 6.20c, Pittsburgh, S. San Francisco, Calif. One producer quotes 5.60c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

**Nails and Staples:** Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind.; 109 Worcester, Mass.; 110, Minnequa, Colo., Atlanta; 117, Portsmouth, O.; 123, Pittsburgh, Calif.; 124, Cleveland; 126, Monessen, Pa.; \$6.75c per 100 pound keg, Conshohocken, Pa., Wheeling, W. Va. One producer quotes column 109, Chicago and Pittsburgh base; another, column 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

**Woven Fence** (9 to 15½ Gage, inclusive): Column 109, mill, except: 113, Monessen, Pa.; Kokomo, Ind.; 115, Minnequa, Colo.; 121, Atlanta; 132, Pittsburgh, Calif. One producer quotes column 113, Pittsburgh and Chicago base; another column 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

**Barbed Wire:** Column 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind.; 126, Atlanta; 128, Monessen, Pa.; 130, Minnequa, Colo.; 143, Pittsburgh, Calif.; 145, S. San Francisco. One producer quotes 127, Chicago and Pittsburgh base.

**Fence Posts** (with clamps): Column 114, DuRue; 115, Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Pa.; \$123.50 per net ton, Williamsport, Pa.

**Bale Ties** (single loop): Column 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind.; 110, Atlanta; 113 Minnequa, Colo.; 130, S. San Francisco, Pittsburgh, Calif. One producer quotes col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

## Stainless Steels

(Mill prices, cents per pound)

### CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301.....	28.50-28.75	30.50-32.00	37.50-40.75
302.....	28.50-28.75	33.00-33.75	37.50-40.75
303.....	31.00-31.50	35.50-39.75	39.50-43.00
304.....	30.00-31.25	35.00-35.75	39.50-43.00
316.....	46.00-48.00	55.00-57.25	53.00-57.25
321.....	24.00-34.75	44.50-45.75	45.50-49.00
347.....	38.50-39.75	48.50-50.25	50.00-54.00

### STRAIGHT CHROMIUM STEELS

410.....	22.75-23.00	26.50-27.00	32.00-33.00
416.....	23.25-23.50	28.25-33.50	32.50-33.50
430.....	23.25-23.50	27.00-27.50	34.75-35.50
446.....	32.50-33.00	60.00-62.25	46.50-50.00

### STAINLESS-CLAD STEELS

Type No.	Plates —Cladding—		Sheets —Cladding—	
	10%	20%	10%	20%
302.....	19.75	21.50	19.75	21.50
304.....	22.50	26.50	20.75	22.50
310.....	32.50	36.50	.....	.....
316.....	27.00	31.00	26.00	28.00
321.....	23.50	27.50	.....	.....
347.....	25.00	29.00	24.00	26.00
405.....	18.75	24.75	.....	.....
410.....	18.25	24.25	.....	.....
430.....	18.25	24.25	.....	.....

## Tool Steels

**Tool Steel:** Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

## Tubular Goods

**Standard Steel Pipe:** Mill prices in carlots, threaded and coupled, to consumers about \$200 a net ton.

In.	Butt Weld			In.	Elec. Weld		
	Bk.	Gal.	Gal.		Bk.	Gal.	Gal.
1/8.....	39 1/2	8 1/2	1.....	46	25	25	25
1/4.....	41 1/2	12 1/2	1 1/4.....	48 1/2	27 1/2	27 1/2	27 1/2
3/8.....	37 1/2	9 1/2	1 1/2.....	46 1/2	25 1/2	25 1/2	25 1/2
1/2.....	39 1/2	14	1 3/4.....	49	28	28	28
3/4.....	34 1/2	4 1/2	2.....	47 1/2	26 1/2	26 1/2	26 1/2
1.....	36	9	2 1/4.....	50	29	29	29
1 1/4.....	40 1/2	18	3.....	48	27	27	27
1 1/2.....	43 1/2	21 1/2	3 1/4.....	50 1/2	29 1/2	29 1/2	29 1/2
1 3/4.....	46	24 1/2	3 1/2 & 4.....	44 1/2	22 1/2	22 1/2	22 1/2

In.	Lap Weld			In.	Seamless		
	Bk.	Gal.	Gal.		Bk.	Gal.	Gal.
2.....	39 1/2	17 1/2	38 1/2	17	27	27	27
2 1/2.....	42 1/2	20 1/2	41 1/2	19 1/2	32 1/2	10 1/2	10 1/2
3.....	43 1/2	21 1/2	41 1/2	19 1/2	35	13	13
3 1/2.....	43 1/2	21 1/2	43 1/2	21 1/2	38 1/2	16 1/2	16 1/2
3 1/2 & 4.....	46 1/2	24 1/2	43 1/2	21 1/2	43 1/2	22	22
5 & 6.....	42 1/2	20 1/2	43 1/2	21 1/2	38 1/2	16 1/2	16 1/2
7.....	44 1/2	22 1/2	43 1/2	22	43 1/2	22	22

**Line Steel Pipe:** Mill prices in carlots to consumers about \$200 a net ton.

In.	Butt Weld			In.	Butt Weld		
	Bk.	Gal.	Gal.		Bk.	Gal.	Gal.
1/8.....	40 1/2	.....	1 1/4.....	46	26	26	26
1/4.....	38 1/2	.....	1 1/2.....	48	27	27	27
3/8.....	35	.....	1 3/4.....	46 1/2	26 1/2	26 1/2	26 1/2
1/2.....	40	18 1/2	2.....	48 1/2	28	28	28
3/4.....	42	19 1/2	2 1/4.....	47	26 1/2	26 1/2	26 1/2
1.....	45	23 1/2	2 1/2 & 3.....	47 1/2	27	27	27
1 1/4.....	45 1/2	25 1/2	3 1/4 & 4.....	49 1/2	28 1/2	28 1/2	28 1/2
1 1/2.....	47 1/2	26 1/2	3 1/2 & 4.....	43 1/2	23	23	23

In.	Lap Weld			In.	Seamless		
	Bk.	Gal.	Gal.		Bk.	Gal.	Gal.
2.....	38 1/2	16 1/2	37 1/2	15 1/2	26	4	4
2 1/2.....	42 1/2	20 1/2	40 1/2	19 1/2	37 1/2	16	16
3.....	42 1/2	20 1/2	40 1/2	19 1/2	34	12	12
3 1/2.....	41 1/2	20	42 1/2	20 1/2	40 1/2	19	19
4.....	45 1/2	23 1/2	42 1/2	20 1/2	37 1/2	15 1/2	15 1/2
5 & 6.....	43 1/2	20	42 1/2	20 1/2	37 1/2	15 1/2	15 1/2
8.....	45 1/2	.....	44 1/2	21 1/2	40 1/2	17 1/2	17 1/2
10.....	45	.....	44	21	41 1/2	18 1/2	18 1/2
12.....	44	.....	43	20	40 1/2	17 1/2	17 1/2

**Standard Wrought Iron Pipe:** Mill price in carlots, threaded and coupled, to consumers about \$200 a net ton.

In.	Butt Weld			In.	Lap Weld		
	Bk.	Gal.	Gal.		Bk.	Gal.	Gal.
1/8.....	59 1/2	95 1/2	1 1/4.....	22	53	53	53
1/4.....	59 1/2	62 1/2	1 1/2.....	21	45 1/2	45 1/2	45 1/2
3/8.....	59 1/2	41 1/2	2.....	7	36 1/2	36 1/2	36 1/2
1.....	59 1/2	31 1/2	2 1/2 & 3.....	5	32	32	32
1 1/4.....	4 1/2	32 1/2	4.....	List	26	26	26
1 1/2.....	4 1/2	29	4 1/2	8	2	27 1/2	27 1/2
2.....	2	28 1/2	9	12	12	37	37

**Boiler Tubes:** Net base c. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

**O.D. B.W. —Seamless—**

In.	G.A.	H.R.	C.D.	H.R.	C.D.
1	13	.....	13.39-14.64	13.00	13.00
1 1/4	13	.....	15.97-17.34	13.21	15.39
1 1/2	13	18.45	17.71-19.35	14.60	17.18
2	13	18.71	20.15-22.02	16.60	19.54
2 1/2	13	20.96	22.56-24.66	18.60	21.89
3	13	23.38	25.16-27.50	20.73	24.40
3 1/2	12	23.54-25.73	27.70-30.28	22.83	26.88
4	12	25.79-28.19	30.33-33.15	25.02	29.41
5	12	27.33-29.87	32.14-35.13	26.51	31.18
6	12	28.68-31.35	33.76-36.90	27.82	32.74
8	11	33.39-36.50	39.29-42.95	32.39	38.11
10	11	35.85-39.19	42.20-46.13	34.78	40.94
12	10	44.51-48.65	52.35-57.22	43.17	50.73
14	9	58.99-64.47	69.42-75.88	.....	.....
16	9	68.25-74.64	80.35-87.82	.....	.....
18	7	104.82-114.57	123.33-134.81	.....	.....

**Pipe, Cast Iron:** Class B, 6-in. and over, \$98.50 per net ton, Birmingham; \$106.70, del. Chicago; 4-in. pipe, \$5 higher; Class A pipe, \$5-a ton over Class B.

## Rails, Supplies



## RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

## Pig Iron

	Per gross Ton			
	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace ....	\$48.00	\$48.50	\$49.00	\$49.50
Newark, N. J., del. ....	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del. ....	50.3002	50.8002	51.3002	51.8002
Philadelphia, del. ....				
Birmingham, furnace ....	42.88	43.38	....	....
Cincinnati, del. ....	....	49.43	....	....
Buffalo, furnace ....	47.00	47.00	47.50	48.00
Boston, del. ....	56.20	56.20	56.70	....
Rochester, del. ....	49.35	49.35	49.85	50.35
Syracuse, del. ....	50.2065	50.2065	50.7065	51.2065
Chicago, district furnaces ..	46.00	46.00-46.50	46.50	47.00
Milwaukee, del. ....	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del. ....	....	51.28-51.78	51.78	....
Cleveland, furnace ....	46.00	46.50	46.50	47.00
Akron, del. ....	48.3002	48.8002	48.8002	49.3002
Lone Star, Tex., furnace ....	....	↑75.00	....	....
Duluth, furnace ....	....	46.50	46.50	47.00
Erie, Pa., furnace ....	46.00	46.50	46.50	47.00
Everett, Mass., furnace ....	....	52.75	53.25	....
Geneva, Utah, furnace ....	46.00	46.50	....	....
Seattle, Tacoma, Wash., del. ....	....	54.0578	....	....
Portland, Oreg., del. ....	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace ...	47.90	48.40	48.90	....
St. Louis, del. ....	49.40	49.90	50.40	....
Ironton, Utah, furnace ....	....	46.50	....	....
†Neville Island, Pa., furnace ..	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace ....	46.00	46.50	46.50	47.00
Steelton, Pa., furnace ....	48.00	48.50	49.00	49.50
Struthers, O., furnace ....	42.50	....	....	....
Swedeland, Pa., furnace ....	50.00	50.50	51.00	....
Toledo, O., furnace ....	46.00	46.50	46.50	47.00
Cincinnati, del. ....	50.8230	51.3230	....	....
Youngstown, O., furnace ....	46.00	46.50	46.50	47.00
Mansfield, O., del. ....	50.1022	50.6022	50.6022	51.1022

† Low phosphorus southern grade.

‡ To Neville Island base add: \$0.86 for McKees Rocks, Pa.; \$1.31 Lawrenceville, Homestead, McKeesport, Monaca; \$1.73 Verona; \$1.94 Brackenridge; \$1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

## Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base) ..	\$59.50
6.51-7.00 ..	60.75
7.01-7.50 ..	62.00
7.51-8.00 ..	63.25
8.01-8.50 ..	64.50
8.51-9.00 ..	65.75
F.o.b. Jackson, O., per gross ton	\$1.25 higher.

## Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus \$1 per gross ton	
Electric Furnace Silvery Pig Iron	
Si 14.01-14.50% ..	\$84.75 furnace,
Niagara Falls; \$84 open-hearth and	
\$85 foundry grade, Keokuk, Iowa.	
Piglets, Si 18%, \$91, Keokuk, Iowa.	
Add \$1 a ton for each additional	
0.5% Si to 18%; \$1 for each	
0.5% Mn over 1%; \$1 a ton for	
0.45% max. P.	

## Charcoal Pig Iron

Semi-cold blast, low phosphorus.	
F.o.b. furnace, Lyles, Tenn. ....	\$.66
(For higher silicon iron a differential	
over and above the price of	
base grade is charged as well as	
for the hard chilling iron, Nos. 5	
and 6.)	

## Low Phosphorus

Steelton, Pa., \$54; Buffalo, Troy,	
N. Y., \$50; Philadelphia, \$56.9786	
delivered.	

Intermediate phosphorus, Central furnace, Cleveland, \$51.

## Electrodes

(Threaded, with nipples, unboxed)

Inches—		Cents per lb.
Diam.	Length	f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
8	48, 60	19.00
4, 5%	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

## Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF<sub>2</sub> content, 70% or more, \$37; less than 60%, \$34.

## Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace, ..	\$13.50-15.50
Connellsville, foundry ..	16.00-18.00
New River, foundry ..	16.50
Wise county, foundry ..	15.35
Wise county, furnace ..	14.60
Open Foundry Coke	
Kearney, N. J., ovens ..	\$22.00
Everett, Mass., ovens ..	....
New England, del.† ..	23.35
Chicago, ovens ..	20.40
Chicago, del. ....	↑21.85
Detroit, del. ....	24.16
Terre Haute, ovens ..	21.00
Milwaukee, ovens ....	21.15
Indianapolis, ovens ..	20.85
Chicago, del. ....	24.19
Cincinnati, del. ....	23.66
Detroit, del. ....	24.61
Ironton, O., ovens ....	19.40
Cincinnati, del. ....	21.63
Painesville, O., ovens ..	20.90
Buffalo, del. ....	23.42
Cleveland, del. ....	22.55
Erie, del. ....	22.70
Birmingham, ovens ..	17.70
Philadelphia, ovens ..	21.05
Swedeland, Pa., ovens ..	21.00
Portsmouth, O., ovens ..	19.50
Detroit, ovens ..	20.65
Detroit, del. ....	*21.70
Buffalo, del. ....	22.75
Flint, del. ....	22.98
Pontiac, del. ....	21.98
Saginaw, del. ....	23.30

Includes representative switching charge of: \*, \$1.05; †, \$1.45. ‡ Or within \$4.03 freight zone from works.

## Coal Chemicals

Spot, cents per gallon, ovens	
(Price effective as of Aug. 5)	
Pure benzol ..	20.00
Toluol, one degree ....	20.50-26.50
Toluol, two degrees ....	23.00-26.50
Industrial xylol ..	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia ....	\$45.00
Per pound, ovens	
(Effective as of Oct. 1)	
Phenol, 40 (carlots, re-	
turnable drums) ....	13.50
Do., less than carlots ..	14.25
Do., tank cars ..	12.50
Effective as of Oct. 25)	
Naphthalene flakes, a,	
balls, bbl to jobbers,	
"household use" ....	13.75

## Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick	
Super Duty: St. Louis, Vandalla,	
Farber, Mexico, Mo., Olive Hill,	
Ky., Clearfield, or Curwensville,	
Pa., Ottawa, Ill., \$100. Hard-	
ened, \$135 at above points.	
High-heat Duty: Salina, Pa., \$85;	
Woodbridge, N. J., St. Louis,	
Farber, Vandalla, Mexico, Mo.,	
West Decatur, Orvison, Clear-	
field, Beach Creek, or Curwens-	
ville, Pa., Olive Hill, Hitchins,	
Haldeman, or Ashland, Ky.,	
Troup, or Athens, Tex., Stevens	
Pottery, Ga., Portsmouth, or Oak	
Hill, O., Ottawa, Ill., \$80.	
Intermediate-Heat Duty: St. Louis,	
or Vandalla, Mo., West Decatur,	
Orvison, Beach Creek, or Clear-	
field, Pa., Olive Hill, Hitchins,	
or Haldeman, Ky., Athens, or	
Troup, Tex., Stevens Pottery, Ga.,	
Portsmouth, O., Ottawa, Ill., \$74.	
Low-Heat Duty: Oak Hill, or Ports-	
mouth, O., Clearfield, Orvison,	
Pa., Bessemer, Ala., Ottawa, Ill.,	
\$66.	
Ladle Brick	
Dry Press: \$55, Freeport, Merill	
Station, Clearfield, Pa.; Chester,	
New Cumberland, W. Va.; Iron-	
dale, Wellsville, O.	
Wire Cut: \$53, Chester, New Cum-	
berland, W. Va.; Wellsville, O.	
Malleable Bung Brick	
St. Louis, Mo., Olive Hill, Ky.,	
Ottawa, Ill., \$90; Beach Creek,	
Pa., \$80.	
Silica Brick	
Mt. Union, Claysburg, or Sproul,	
Pa., Ensley, Ala., \$80; Hays, Pa.,	
\$85; Joliet or Rockdale, Ill., E.	

Chicago, Ind., \$89; Lehi, Utah, Los Angeles, \$95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, \$80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., \$81.

## Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.) Burned chrome brick, \$66; chemical-bonded chrome brick, \$69; magnesite brick, \$91; chemical-bonded magnesite, \$80.

## Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.) Domestic dead-burned, %" grains; Bulk, \$30.50-31.00; single paper bags, \$35.00-35.50.

## Dolomite

(Base prices per net ton) Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibonsburg, Woodville, O., \$12.25; Thornton, McCook, Ill., \$12.35; Dolly Siding, Bonne Terre, Mo., \$12.45.

## Ores

## Lake Superior Iron Ore

Gross ton, 51½% (natural)

## Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer .....	\$7.60
Old range nonbessemer .....	7.45
Mesabi bessemer .....	7.35
Mesabi nonbessemer .....	7.20
High phosphorus .....	7.20

## Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% concentrates, contract .... 16.00

## Foreign Ore

Cents per unit, c.i.f. Atlantic ports: Swedish basic, 60 to 68% .... 15.00; Brazil iron ore, 68-69% .... 19.50

## Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid ..... \$26-\$28

## Manganese Ore

48-50%, duty paid, f.o.b. cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60%-72.60%.

## Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash.

(S B paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1 .....	\$37.50
48% 3:1 .....	39.00
48% no ratio .....	31.00
South African (Transvaal)	
44% no ratio .....	\$25.50-26.00
45% no ratio .....	26.50
48% no ratio .....	29.00-30.00
50% no ratio .....	29.50-30.50

## Brazilian—nominal

44% 2.5:1 lump..... \$33.65

## Rhodesian

45% no ratio ..... \$27-\$27.50  
48% no ratio ..... 30.00  
48% 3:1 lump ..... 39.00

Domestic (seller's nearest rail)

48% 3:1 ..... \$39.00

## Molybdenum

Sulphide conc., lb. Mo., cont., Mines ..... \$0.90

## WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	H-R	C-R	H-R Rds. 3/8" to 3"	C-F Rds. 1/2" & up	H-R Alloy **4140		Carbon 3/8"-3/4"	Floor 3/8" & Thicker
New York (city)	5.50	6.76	7.91	5.92	...	5.80	6.61	8.68	5.53	5.90	7.51
New York (c'try)	5.60	6.56	7.71	5.72	...	5.60	6.41	8.48	5.33	5.70	7.31
Boston (city) ..	6.10	6.70	8.00	6.10	...	5.67	6.42	8.72	5.57	5.95	7.40
Boston (c'try) .	5.95	6.55	7.85	5.95	...	5.52	6.27	8.57	5.42	5.80	7.25
Phila. (city)...	5.72	6.64	7.53-7.58	5.60	...	5.55	6.34	8.40	5.25	5.53	6.74
Phila. (c'try) ..	5.57	6.59	7.38-7.43	5.45	...	5.40	6.19	8.25	5.10	5.38	6.59
Balt. (city) ...	5.46†	6.36	7.26	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31†	6.21	7.11	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse) .	5.84-6.00	...	...	5.90	...	5.91-5.95	6.61	...	5.85-5.89	6.05-6.09	7.50-7.54
Buffalo (del.)..	5.00	5.90	7.85	5.49	6.50	5.20	6.05	10.13	5.25	5.50	7.06
Buffalo (w'hse)	4.85	5.75	7.70	5.34	6.35	5.05	5.90	9.98	5.10	5.35	6.91
Pitts. (w'hse) ..	4.85-5.00‡	5.75-5.85‡	7.15-7.70	5.00-5.35	5.95-6.00	4.90-5.10	5.65	7.65	4.90-5.15	5.05-5.25	6.55
Detroit (w'hse) .	4.85-5.00‡	5.75-5.85‡	7.15	5.00-5.35	5.95-6.00	5.45	6.17	8.12	5.45	5.65-5.80	7.10
Cleveland (del.)	5.13-5.90††	5.90-6.31	7.35-8.10††	5.18-5.31	6.60-6.85	5.32-5.36	6.05-6.12	8.24-8.56	5.35-5.62	5.52-5.56	6.95-7.01
Cleve. (w'hse) .	4.98-5.75	5.75-6.16	7.20-7.95	5.03-5.16	6.70	5.17-5.21	5.90-5.97	8.24-8.41	5.21-5.47	5.37-5.41	6.80-6.86
Cincin. (w'hse) .	5.29	6.14	7.63	5.55	6.10	5.55	6.10	...	5.40	5.64	6.94
Chicago (city) ..	5.20	5.90‡§	7.30	5.00	6.67-6.80	5.05	5.85	8.25‡	5.05	5.25	6.70
Chicago (w'hse) .	4.85-5.05	5.75‡§	7.15	4.85	6.52-6.65	4.90	5.70	8.10‡	4.90	5.10	6.55
Milwaukee (city)	5.38	6.08‡§	7.48	5.18	6.82-6.98	5.23	6.03	8.43‡	5.23	5.43	6.88
St. Louis (del.)	5.34‡	6.24‡	7.44	5.34	6.64	5.39	6.19‡	6.64	5.39	5.59	7.04
St. L. (w'hse) .	5.19‡	6.09‡	7.29	5.19	6.49	5.24	6.04‡	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20‡	...	6.60	5.20	...	5.15	6.66-6.83	...	5.15	5.40	7.41-7.73‡
Birm'ham (c'try)	5.05‡	...	6.45	5.05	...	5.00	6.61-6.68	...	5.00	5.25	7.26-7.58‡
Omaha, Nebr...	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Ang. (city)	6.55‡	8.05	8.20†	6.75	9.50	6.20	8.00-8.50	...	6.70	6.40	8.15
L. A. (w'hse) ..	6.40‡	7.90	8.05†	6.60	9.35	6.05	7.85-8.35	...	6.55	6.25	8.00
San Francisco .	5.95‡‡	7.15	8.05	6.75‡‡	8.25‡‡	5.90‡‡	7.55	10.20‡‡	5.90	7.60	8.10
Seattle-Tacoma.	6.35‡‡	7.90‡	8.40	6.70‡‡	...	6.20‡‡	8.15‡	9.45‡	6.30‡‡	6.35‡‡	8.40‡‡

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; 1—1500 lb and over; 2—1000 to 4999 lb; 3—450 to 39,999 lb; 4—three to 24 bundles; 5—450 to 1499 lb; 6—400 to 14,999 lb; 7—400 to 1499 lb; 8—1000 to 1999 lb; 9—1000 to 39,999 lb; 10—1000 lb and over; 11—2000 lb and over; 12—300 to 999 lb; 13—1500 to 1999 lb; 14—1500 to 39,999 lb; 15—400 to 3999 lb; 16—400 lb and over; 17—250 to 1499 lb; 18—Price (but not other price in range) applies to any and all quantities.

\* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; \*\* as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ top level of quoted range is nominal.

## Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

## Carriage and Machine Bolts

1/2-in. and smaller; up to 6 in. in length	35 off
3/4 and 5/8 x 6-in. and shorter	37 off
3/4-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

## Stove Bolts

in packages, nuts separate, 58 1/2-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

## Nuts

	A.S. f.o.b.	A.S. Reg. and
	Light	Heavy
Semifinished hexagon	41 off	...
1/2-in. and smaller	...	38 off
3/4-in. and smaller	39 off	...
1/2-in.-1-in.	...	37 off
3/4-in.-1-in.	37 off	35 off
1 1/2-in.-1 1/2-in.	34 off	28 off
1 1/2-in. and larger	...	...
Additional discount of 15 for full containers.		

## Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated)	...
5/8 and smaller x 6 and shorter	40 off
3/4, 1, & 1 x 6-in. and shorter	35 off

## Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, 1/4-in. and larger	31 off

## Rivets

F.o.b. midwestern plants

Structural 1/2-in. and larger	6.75c
1/2-in. and under	48 off

## Washers, Wrought

F.o.b. shipping point, to jobbers. Net to \$1 off

## FERROALLOY PRODUCT PRICES

## MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, \$62, Palmetton, Pa.; \$66, Pittsburgh and Chicago; (16% to 19% Mn) \$1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk, \$160 per gross ton of alloy, c.i., packed, \$172; gross ton lots, packed, \$187; less gross ton lots, packed, \$204; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: \$165, Rockwood, Tenn.; \$162, f.o.b. Birmingham and Johnstown, Pa.; furnaces; \$160, Sheridan, Pa.; \$163, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add \$31 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Ore. Shipment from Chicago warehouse, ton lots, \$201; less gross ton lots, \$218 f.o.b. Chicago. Add or subtract \$2 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. Special Grade: (Mn 90% approx., C 0.07% max., P. 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload, 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 25c. Premium for hydrogen-removed metal 1.5c per pound. F.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

## CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.i., lump, bulk 20.5c per lb of contained Cr, c.i., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.i., 8MxD, bulk 22.0c per lb of contained Cr, c.i., packed 22.9c, ton lot 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C, 31.85c per lb of contained Cr, 0.04% C, 29.75c, 0.06% C, 28.75c, 0.10% C, 28.25c-28.5c, 0.15% C, 28.0c, 0.20% C, 27.75c, 0.50% C, 27.5c, 1% C, 27.25c, 1.50% C, 27.1c, 2% C, 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, \$1.03 per lb of contained chromium, ton lot \$1.05, less ton \$1.07. Delivered. Spot, add 5c.

(Please turn to Page 164)



# Engineers Survey Metals Future

**Need for suitable tax procedures and improved exploration methods stressed at meeting of American Institute of Mining & Metallurgical Engineers. Metal markets hold**

New York—Addresses delivered at the San Francisco meeting last week of the American Institute of Mining & Metallurgical Engineers stressed the "serious depletion of many of the American mineral resources and the seriousness of the smug complacency 'that all we need to do is to go out and dig some more.'" Dr. Alan M. Bateman, head of the Department of Geological Sciences, Sheffield Scientific School, Yale University, expressed the opinion that the reported years of life (19 for copper, 10 for lead, and 20 for zinc) as presented in a government report were probably too conservative and that these estimates would be exceeded if we had suitable tax procedures, improved exploration and ore finding methods. He expressed doubt as to whether we shall ever return to self-sufficiency with respect to copper, lead and zinc.

Richard J. Lund, supervisor of Engineering Economics, Battelle Memorial Institute, Columbus, O., called for continued accelerated efforts for realistic objectives in stockpiling. He said this may involve some measure of harm or inconvenience to some segments of the mineral industry and that it would be a wise investment in our national security.

Otto Herres, vice president, Combined Metals Reduction Co., said that sound mineral policies are essential and that "we must consider labor-management relations, tariffs and incentives to induce venture capital to return to the field of mine development, all in the light of the increasing responsibilities over industry being assumed by government."

Copper — House of Representatives passed a bill last week suspending the tariff duty on copper ores and concentrates and other copper-containing imports until Mar. 31, 1951. The bill does not affect imports of copper sulphates which are still dutiable under the present law. Except for this suspension of duties, the tariff on ores and concentrates would be 4 cents per pound of copper content. On other imports, the rates vary from 3 per cent ad valorem to 3 cents per pound of copper content under the Tariff Act of 1930.

Despite some curtailments of operations at brass mills, demand for primary copper continues to exceed available supplies. Export business is also holding up well, supported mainly by purchases made with ECA funds.

Production refined copper dropped to only 78,298 tons in January from 96,117 tons in December and 102,779 tons in November, according to the Copper Institute. Production of crude copper eased to 53,701 tons from 54,635 tons in December, or to a daily average rate of only 1732 tons, or the lowest since before the war. Crude copper production by the secondary industry increased to

16,272 tons from 9816 tons. Deliveries declined in January to 96,070 tons from 102,292 while stocks of refined copper eased to 91,053 tons from 96,080 tons at the end of 1948.

Lead — Some lead consumers have requested suppliers to defer shipments of lead, due to a decline in orders for their products. Orders for primary lead are being booked generally on shorter notice and those for March delivery are being received at a comparatively slow rate.

Zinc — Howard I. Young, president, American Zinc, Lead & Smelting Co., said last week that so far as his company is concerned slab zinc is being delivered to consumers as fast as it is produced. He said that he can see no signs of a let-up in demand in any direction.

Tin — Stocks of pig tin held by the Office of Metals Reserve which were available for sale at the end of January amounted to 23,929 tons, a decline of 393 tons from the 24,322 tons on hand at the end of December. The government says 1949 world tin production may reach 170,000 tons which would compare with 150,000 tons in 1948.

Silver — Shortage of spot metal, coupled with continued active demand from domestic consumers, resulted in further advances in the foreign silver market here to 71.50c per ounce. The market had recorded the first change since Nov. 28 on Friday, Feb. 11, when it advanced 3/4-cent to 70.75c, followed by advances of 1/4-cent on Feb. 14 and 1/2-cent Feb. 15. Some Mexican silver that had been scheduled for the Bank of Mexico for use in coinage has been diverted to consumers in the United States to meet the increased demand. Stability of the market during the last three months was due to the Bank of Mexico's purchase of all of the Mexican silver production offered for use in coinage.

Platinum — The leading refiner of platinum reduced its price \$3 an ounce last Monday to the range of \$85 to \$88 per ounce. The 10 per cent iridium alloy is now quoted \$90.25 per ounce. Weakness in the market was attributed to a decline in demand, especially from the jewelry industry. The next previous change had been recorded on Jan. 24.

## Aluminum Product Shipments

Washington — Total shipments of aluminum wrought products during 1948 amounted to 1640 million pounds, 16 per cent higher than the 1408 million pounds shipped during 1947, according to the Bureau of the Census. Of the 1948 total, plate, sheet and strip accounted for 1268 million pounds, or 78 per cent; rolled structural shapes, rod, bar and wire

for 183 million pounds, or 11 per cent; extruded shapes, tube blooms and tubing for 172 million pounds, or 10 per cent; aluminum powder, flake and paste for 17 million pounds.

Shipments of aluminum wrought products during December totaled 126 million pounds, down slightly from the 130 million pounds shipped in November. Although the trend in shipments has been downward in recent months, part of the decline during December may be attributed to the fact that there were fewer working days in December than in the previous month.

## Bolivia Seeks Tin Mill Funds

Washington—Bolivian government representatives opened negotiations last week with officials of the Export-Import Bank on a Bolivian loan request for about \$4 million for construction of a tin concentration plant. Embassy officials said the plant would be located in the Bolivian mining center of Oruro. It would be designed to increase the concentrate of tin exports sent to the melting plant at Texas City, Tex.

## New Wire Mill Opens Books

Oakland, Calif. — Permanent Products Co., a subsidiary of Permanente Metals Corp., expects to start operation of its Newark, O., aluminum mill during the third quarter of 1949. It will produce aluminum electrical conductor products. First shipments to customers are scheduled to begin in the fourth quarter.

Initial quarterly production is estimated to total 15 million pounds. Production will cover the full range of standard sizes.

## Remelt Aluminum Output Drops

Washington—Production of aluminum ingot at secondary smelters dropped to 13,199 short tons in October, the smallest output since April, according to the Bureau of Mines. Production in 1948 continued to run about 5 per cent less than the corresponding period of 1947. Production decreases of 18 per cent in copper-silicon (each over 2.5 per cent) alloy and 26 per cent in No. 12 alloy were principally responsible for the October decline. Miscellaneous alloys registered the largest gain, increasing 63 per cent over September. By the end of October, inventories had decreased 8 per cent from the preceding month, so that despite the 11 per cent decline in production, shipments to consumers dropped only 5 per cent in October.

Use of aluminum scrap by secondary smelters during October decreased in proportion to the drop in ingot production; for the second consecutive month total scrap consumption declined 11 per cent. Of the plant scrap items, new cast scrap and new alloy sheet and clips decreased 33 per cent and 12 per cent, respectively. Aircraft scrap, which fell 16 per cent, showed the greatest loss among obsolete scrap items.

The inability to purchase adequate tonnages of scrap had an effect on prices as well as production.

## NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

**Copper:** Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½c, Conn. Valley.

**Brass Ingot:** 85-5-5-5 (No. 115) 19.50-21.00c; 88-10-2 (No. 215) 30.50c; 80-10-10 (No. 305) 26.25c; No. 1 yellow (No. 405) 17.00-17.50c.

**Zinc:** Prime western 17.50c, brass special 17.75c, intermediate 18.00c, East St. Louis; high grade 18.50c, delivered.

**Lead:** Common 21.30-21.35c, chemical and corroding 21.40c, St. Louis.

**Primary Aluminum:** 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

**Secondary Aluminum:** Piston alloy (6-6 type) 22.50-24.50c; No. 12 foundry alloy (No. 2 grade) 21.50-23.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.00-25.75c; grade 2, 24.00-24.50c; grade 3, 23.25-23.50c; grade 4, 22.50-22.75c. Prices include freight at carload rate up to 75 cents per 100 lb.

**Magnesium:** Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

**Tin:** Grade A, 99.8% or higher (including Straits) \$1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, \$1.025; grade C, 99.65-99.79%, incl., \$1.024; 99.5-99.649% \$1.024, grade F, 98.98-99.9% \$1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

**Antimony:** American 99-98.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

**Nickel:** Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.: "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

**Mercury:** Open market, spot, New York \$88-\$94 per 76-lb flask.

**Beryllium-Copper:** 3.75-4.25% Be, \$24.50 per lb contained Be.

**Cadmium:** "Regular" straight or flat forms, \$2 del.; special or patented shapes, \$2.10.

**Cobalt:** 97-98%, \$1.65 per lb for 550 lb (keg); \$1.67 per lb for 100 lb (case); \$1.72 per lb under 100 lb.

**Gold:** U. S. Treasury, \$35 per ounce.

**Silver:** Open market, New York, 71.00c per ounce.

**Platinum:** \$85-\$88 per ounce.

**Palladium:** \$24 per troy ounce.

**Iridium:** \$105-\$110 per troy ounce.

**Titanium (sponge form):** \$5 per pound.

## Rolled, Drawn, Extruded Products

## COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

**Sheet:** Copper 37.18; yellow brass 34.59; commercial bronze, 95%, 37.23; 90%, 36.88; red brass, 85%, 36.01; 80%, 35.66; best quality, 35.33; nickel silver, 18%, 46.92; phosphor-bronze, grade A, 5%, 56.05.

**Rods:** Copper, hot rolled 33.28; cold drawn 34.28; yellow brass, free cutting, 38.16; commercial bronze, 95% 36.92; 90% 36.57; red brass, 85% 35.70; 80% 35.35.

**Seamless Tubing:** Copper 37.22; yellow brass 37.60; commercial bronze 90% 39.54; red brass 85% 38.82; 80% 38.57.

**Wire:** Yellow brass 34.88; commercial bronze, 95% 37.52; 90% 37.17; red brass, 85% 36.30; 80% 35.95; best quality brass 35.62.

**Copper Wire:** Bare, soft, f.o.b. eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weather-proof, f.o.b. eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

## ALUMINUM

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	C.1. Coiled Sheet Circle†
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.063	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.045	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

\* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	Round		Hexagonal	
	R317-T4, 17S-T4	R317-T4	17S-T4	17S-T4
0.125	48.0	...	...	...
0.156-0.203	41.0	...	...	...
0.219-0.313	38.0	...	...	...
0.344	37.0	...	47.0	...
0.375	36.5	45.5	44.0	...
0.406	36.5	...	...	...
0.438	36.5	45.5	44.0	...
0.469	36.5	...	...	...
0.500	36.5	45.5	44.0	...
0.531	36.5	...	...	...
0.563	36.5	...	41.5	...
0.594	36.5	...	...	...
0.625	36.5	43.0	41.5	...
0.656	36.5	...	...	...
0.688	36.5	...	41.5	...
0.750-1.000	35.5	40.5	39.0	...
1.063	35.5	...	37.5	...
1.125-1.500	34.5	39.0	37.5	...
1.563	34.5	...	37.5	...
1.625	33.5	...	36.5	...
1.688-2.000	33.5	...	...	...
2.125-2.500	32.5	...	...	...
2.625-3.375	31.5	...	...	...

## LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, \$27.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft. Pipe: Full coils, \$27.25 per cwt.; cut coils, \$27.50. Traps and Bends: List price plus 70%.

## ZINC

Sheets, 22.00-22.50c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.75-21.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.75-20.50c; over 12-in., 20.75-21.50c.

## NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

## MONEL

(Base prices, f.o.b. mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

## MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb. 52.00-56.00c; 25 to 99 lb. 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

## Plating Materials

**Chromic Acid:** 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

**Copper Anodes:** Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

**Copper Cyanide:** 70-71% Cu, 100-lb drums, 46.00c, f.o.b. Niagara Falls, N. Y.

**Sodium Cyanide:** 96-98%, ½-cz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, f.o.b. Niagara Falls, N. Y.

**Copper Carbonate:** 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

**Nickel Anodes:** Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland. Add 1 cent for rolled depolarized.

**Nickel Chloride:** 100-lb kegs, 26.50c; 275-lb, or 500-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 3 or more kegs.

**Tin Anodes:** Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Seward, N. J.

**Sodium Stannate:** 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9000 lb, 59.4c. Prices f.o.b. Seward, N. J. Freight not exceeding St. Louis rate allowed.

**Zinc Cyanide:** 100-lb drums 39.25c, f.o.b. Cleveland; 39.00c, Detroit; 38.00c, f.o.b. Philadelphia.

**Stannous Sulphate:** Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

**Stannous Chloride (anhydrous):** In 400 lb bbl, 97.00c; in 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

## Scrap Metals

## BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean	Rod	Clean
	Heavy	Ends	Turnings
Copper .....	21.125	21.125	20.375
Yellow brass .....	18.875	18.625	18.125
Commercial Bronze			
95% .....	20.250	20.000	19.500
90% .....	20.125	19.875	19.375
Red brass			
85% .....	20.000	19.750	19.250
80% .....	19.875	19.625	19.125
Best Quality (71-79%)	19.750	19.500	19.000
Muntz Metal .....	18.250	18.000	17.500
Nickel, silver, 10% ..	20.250	20.000	10.000
Phos. bronze, A.....	22.625	22.375	21.375
Naval brass .....	18.750	18.500	18.000
Manganese bronze ...	18.750	18.500	17.875

## BRASS INGOT MAKERS

## BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 19.25, No. 2 copper 18.25, light copper 17.25, composition red brass 14.25-14.50, auto radiators 12.50-12.75, heavy yellow brass 10.75-11.00.

## REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 19.75, No. 2 copper 18.75, light copper 17.75, refinery brass (60% copper), per dry copper content 17.75.

## DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

**Copper and Brass:** Heavy copper and wire No. 1 17.75-18.25, No. 2 16.75-17.25, light copper 15.75-16.25, No. 1 composition red brass 13.00-13.25, No. 1 composition turnings 12.50-12.75, mixed brass turnings 7.75-8.00, new brass clippings 15.25-15.75; No. 1 brass rod heavy yellow brass 9.50-9.75, new brass rod ends 11.75-12.25, auto radiators, unweated 11.25-11.50, cocks and faucets 11.00-11.25, turnings 11.25-11.75, light brass 7.00-7.25, brass pipe 11.25-11.50.

**Lead:** Heavy 16.00-16.50, battery plates 8.25-8.50, linotype and stereotype 17.00-17.50, electrolyte 15.50-16.00, mixed babbitt 19.00-19.50, solder joints, 22.00-23.00.

**Zinc:** Old zinc 8.50-9.00, new die cast scrap 9.00-9.50, old die cast scrap 6.00-6.50.

**Tin:** No. 1 pewter 65.00-67.00, block tin pipe 82.00-83.00, No. 1 babbitt 50.00-53.00, alphon tops 49.00-51.00.

**Aluminum:** Clippings 28 15.50-16.00, old sheets 10.50-11.00, crankcase 10.50-11.00, borings and turnings 6.00-6.50, pistons, free of struts, 10.50-11.00.

## DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Jan. Avg. ....	23.50	21.325	17.50	103.00	17.00	38.50	40.00	70.00
Dec. Avg. ....	23.50	21.325	17.50	103.00	17.00	38.50	40.00	70.00
Nov. Avg. ....	23.50	21.325	16.580	103.00	17.00	38.50	40.00	73.655
Feb. 1-10 .....	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00	70.00
Feb. 11-12 .....	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00	70.75
Feb. 14 .....	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00	71.00
Feb. 15-17 .....	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00	71.50

**NOTE:** Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.



# OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

## PITTSBURGH

No. 1 Hvy. Melt. ....	\$39.00
No. 2 Hvy. Melt. ....	37.00
No. 1 Busheling. ....	39.00
No. 1 Bundles. ....	39.00
No. 2 Bundles. ....	37.00
No. 3 Bundles. ....	35.00-36.00
Machine Shop Turnings	30.00-31.00*
Mixed Borings, Turnings	30.00-31.00*
Short Shovel Turnings	31.00-32.00*
Cast Iron Borings. ....	30.00-31.00*
Bar Crops and Plate. ....	45.50-46.50
Low Phos. Steel. ....	45.00-46.00
Heavy Turnings. ....	35.50-37.50

### Cast Iron Grades†

Mixed Yard. ....	45.00-46.00
No. 1 Machinery Cast. ....	59.00-60.00
Charging Box Cast. ....	49.00-50.00
Heavy Breakable Cast. ....	48.00-49.00
Brake Shoe. ....	47.00-48.00

### Railroad Scrap

No. 1 R.R. Heavy Melt. ....	42.00
Axles. ....	51.00-53.50
Rails, Random Lengths	47.00-48.00*
Rails, 3 ft. and under. ....	53.00-54.00
Rails, 18 in. and under. ....	54.00-55.00
Railroad Specialties. ....	48.00-50.00
Angles, Splice Bars. ....	54.00-55.00

\* Brokers' buying prices.  
† Nominal.

## CLEVELAND

No. 1 Heavy Melt. Steel	\$37.00-37.50
No. 2 Heavy Melt. Steel	37.00-37.50
No. 1 Busheling. ....	37.00-37.50
No. 2 Bundles. ....	36.00-36.50
Machine Shop Turnings	26.00-27.00
Mixed Borings, Turnings	29.00-30.00
Short Shovel Turnings. ....	29.00-30.00
Cast Iron Borings. ....	29.00-30.00
Bar Crops and Plate. ....	40.50-41.50
Punchings & Plate Scrap	40.50-41.50
Cut Structural. ....	42.00-43.00

### Cast Iron Grades

No. 1 Cupola. ....	50.00-51.00
Charging Box Cast. ....	47.50-48.50
Stove Plate. ....	47.50-48.50
Heavy Breakable Cast. ....	42.50-43.50
Unstripped Motor Blocks	42.50-43.50
Malleable. ....	50.00-51.00
Brake Shoes. ....	44.00-44.50
Clean Auto Cast. ....	55.00-56.00
No. 1 Wheels. ....	52.50-53.50
Burnt Cast. ....	43.50-44.00

### Railroad Scrap

No. 1 R.R. Heavy Melt. ....	41.50-42.00
R.R. Malleable. ....	60.00-60.50
Rails, Rolling. ....	58.00-60.00
Rails, Random Lengths	52.00-53.00
Rails, 3 ft. and under. ....	58.00-60.00
Cast Steel. ....	51.00-52.00
Railroad Specialties. ....	51.00-52.00
Uncut Tires. ....	48.00-50.00
Angles, Splice Bars. ....	54.00-55.00

## VALLEY

No. 1 Heavy Melt. Steel	\$37.50-38.00
No. 2 Heavy Melt. Steel	37.50-38.00
No. 1 Bundles. ....	37.50-38.00
Machine Shop Turnings	30.00-31.00
Short Shovel Turnings	32.00-33.00
Cast Iron Borings. ....	32.00-33.00
Low Phos. ....	44.00-45.00

### Railroad Scrap

No. 1 R.R. Heavy Melt. ....	41.50-42.00
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## MAANSFIELD

Machine Shop Turnings	\$30.00-31.00
Short Shovel Turnings	32.00-33.00

## CINCINNATI

No. 1 Heavy Melt. Steel	\$34.00
No. 2 Heavy Melt. Steel	34.00
No. 1 Busheling. ....	34.00
Nos. 1 & 2 Bundles. ....	34.00

Machine Shop Turnings	27.00
Mixed Borings, Turnings	27.00
Short Shovel Turnings. ....	29.00
Cast Iron Borings. ....	28.00

### Cast Iron Grades

No. 1 Cupola Cast. ....	50.00
Charging Box Cast. ....	43.00
Heavy Breakable Cast. ....	42.00
Stove Plate. ....	42.00
Unstripped Motor Blocks	40.00
Brake Shoes. ....	41.00
Clean Auto Cast. ....	50.00
Drop Broken Cast. ....	54.00

### Railroad Scrap

No. 1 R.R. Heavy Melt. ....	38.00
R.R. Malleable. ....	62.00
Rails, Rolling. ....	52.00
Rails, Random Lengths	46.00
Rails, 18 in. and under. ....	54.00

## DETROIT

(Brokers' buying prices,  
f.o.b. shipping point)

No. 1 Heavy Melt. Steel	\$32.50-33.00
No. 1 Busheling. ....	32.50-33.00
No. 1 Low-phos. ....	
Bundles. ....	36.00-37.00
No. 2 Bundles. ....	32.50-33.00
Machine Shop Turnings	22.50-23.00
Mixed Borings, Turnings	22.50-23.00
Short Shovel Turnings. ....	23.50-24.00
Cast Iron Borings. ....	25.00-26.00
Punchings & Plate Scrap	37.00-38.00

### Cast Iron Grades

No. 1 Cupola Cast. ....	48.00-50.00
Heavy Breakable Cast. ....	43.00-45.00
Clean Auto Cast. ....	48.00-50.00

## BUFFALO

No. 1 Heavy Melt. Steel	\$39.00-40.00
No. 2 Heavy Melt. Steel	34.00-35.00
No. 1 Busheling. ....	34.00-35.00
No. 1 Bundles. ....	34.00-35.00
No. 2 Bundles. ....	32.00-33.00
Machine Shop Turnings	28.00-30.00
Mixed Borings, Turnings	28.00-30.00
Cast Iron Borings. ....	29.00-30.00
Short Shovel Turnings. ....	30.00-31.00
Low Phos. ....	39.00-40.00

### Cast Iron Grades

No. 1 Cupola. ....	43.00-45.00
Mixed Cupola. ....	40.00-42.00
Heavy Breakable Cast. ....	42.00-44.00
Malleable. ....	55.00-60.00
Clean Auto Cast. ....	55.00-57.00

### Railroad Scrap

Rails, 3 ft. and under. ....	55.00-56.00
Railroad Specialties. ....	53.00-54.00

## PHILADELPHIA

No. 1 Heavy Melt. Steel	\$39.00-40.00
No. 2 Heavy Melt. Steel	35.00
No. 1 Busheling. ....	35.00
No. 1 Bundles. ....	38.00
No. 2 Bundles. ....	33.00
Machine Shop Turnings	31.00-31.50
Mixed Borings, Turnings	31.00-31.50
Short Shovel Turnings. ....	34.50-35.50
Bar Crop and Plate. ....	42.00-43.00
Punchings & Plate Scrap	42.00-43.00
Cut Structural. ....	42.00-43.00
Elec. Furnace Bundles. ....	41.00-42.00
Heavy Turnings. ....	39.00

### Cast Iron Grades

No. 1 Cupola Cast. ....	45.00
No. 1 Machinery Cast. ....	48.00-49.00
Charging Box Cast. ....	42.00-43.00
Heavy Breakable Cast. ....	42.00-43.00
Unstripped Motor Blocks	38.00-38.50
Clean Auto Cast. ....	48.00
No. 1 Wheels. ....	48.00-49.00
Malleable. ....	nom.

## NEW YORK

(Brokers' buying prices f.o.b.  
shipping point)

No. 1 Heavy Melt. Steel	\$31.00-32.00
No. 2 Heavy Melt. Steel	29.00-30.00

No. 1 Busheling. ....	29.00-30.00
No. 1 Bundles. ....	31.00-32.00
No. 2 Bundles. ....	29.00-30.00
No. 3 Bundles. ....	26.00-27.00
Machine Shop Turnings	25.00-25.50
Mixed Borings, Turnings	25.00-25.50
Short Shovel Turnings. ....	27.00-27.50
Punchings & Plate Scrap	35.00-36.00
Cut Structural. ....	35.00-36.00
Elec. Furnace Bundles. ....	35.00-36.00

### Cast Iron Grades

No. 1 Cupola Cast. ....	38.00
Charging Box Cast. ....	36.00-37.00
Heavy Breakable. ....	36.00
Unstripped Motor Blocks	34.00
Malleable. ....	nom.

## BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	\$30.00-31.00
No. 2 Heavy Melt. Steel	28.00
No. 1 Bundles. ....	30.00-31.00
No. 1 Busheling. ....	27.00
Machine Shop Turnings	22.00-23.00
Mixed Borings, Turnings	22.00-23.00
Short Shovel Turnings. ....	25.00-26.00
Bar Crops and Plate. ....	32.00-33.00
Punchings & Plate Scrap	32.00-33.00
Chemical Borings. ....	29.00-30.00

### Cast Iron Grades

No. 1 Cupola Cast. ....	42.00-43.00
Heavy Breakable Cast. ....	37.00-38.00
Stove Plate. ....	30.00-32.00
Unstripped Motor Blocks	29.00-30.00
Clean Auto Cast. ....	34.00-36.00

## CHICAGO

No. 1 Heavy Melt. Steel	\$35.00-37.00
No. 2 Heavy Melt. Steel	32.00-33.00
No. 1 Bundles. ....	35.00-37.00
No. 2 Bundles. ....	30.00-33.00
No. 3 Bundles. ....	28.00-30.00
Machine Shop Turnings	24.00-25.00
Mixed Borings, Turnings	24.00-25.00
Short Shovel Turnings. ....	27.00-28.00
Cast Iron Borings. ....	26.00-27.00
Bar Crops and Plate. ....	37.00-40.00
Punchings. ....	35.00-39.00
Elec. Furnace Bundles. ....	38.50-39.50
Heavy Turnings. ....	34.00-35.00
Cut Structural. ....	38.00-39.00

### Cast Iron Grades

No. 1 Cupola Cast. ....	43.00-45.00
Clean Auto Cast. ....	43.00-45.00
No. 1 Wheels. ....	46.00-47.00

### Railroad Scrap

No. 1 R.R. Heavy Melt. ....	36.00-37.00
Malleable. ....	49.00-50.00
Rails, Rolling. ....	46.00-50.00
Rails, Random Lengths	39.00-40.00
Rails, 3 ft. and under. ....	44.00-45.00
Rails, 18 in. and under. ....	46.00-47.00
Railroad Specialties. ....	42.00-43.00
Angles, Splice Bars. ....	46.00-48.00

## ST. LOUIS

No. 1 Heavy Melt. Steel	\$38.00-39.00
No. 2 Heavy Melt. Steel	34.00-35.00
Machine Shop Turnings	23.00-24.00
Short Shovel Turnings. ....	24.00-25.00

### Cast Iron Grades

No. 1 Cupola Cast. ....	46.00-48.00
Mixed Cast. ....	39.00-40.00
Heavy Breakable Cast. ....	32.00-35.00
Brake Shoes. ....	35.00-37.00
Clean Auto Cast. ....	50.00-52.00
Burnt Cast. ....	35.00-37.00

### Railroad Scrap

R.R. Malleable. ....	40.00-45.00
Rails, Rolling. ....	46.00-50.00
Rails, Random Lengths	42.00-43.00
Rails, 3 ft. and under. ....	48.00-50.00
Uncut Tires. ....	40.00-41.00
Angles, Splice Bars. ....	42.00-45.00

## BIRMINGHAM

No. 1 Heavy Melt. Steel	\$33.00
No. 2 Heavy Melt. Steel	33.00
No. 1 Busheling. ....	32.00-33.00
No. 2 Bundles. ....	30.00-31.00
Long Turnings. ....	25.00
Short Shovel Turnings. ....	27.00
Cast Iron Borings. ....	27.50

Bar Crops and Plate. ....	38.00
Cut Structural. ....	38.00

### Cast Iron Grades

No. 1 Cupola Cast. ....	48.00-50.00*
Stove Plate. ....	42.00-43.00*
No. 1 Wheels. ....	44.00-45.00

### Railroad Scrap

No. 1 R.R. Heavy Melt. ....	38.00
R.R. Malleable. ....	nom.
Axles, Steel. ....	60.00-62.00
Rails, Rolling. ....	52.00-55.00
Rails, Random Lengths	38.00-40.00
Rails, 3 ft. and under. ....	46.00-48.00
Angles and Splice Bars	46.00-48.00

\* Nominal.

## SAN FRANCISCO

No. 1 Heavy Melt. Steel	*\$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling. ....	*25.00
Nos. 1 & 2 Bundles. ....	*23.00
No. 3 Bundles. ....	*20.00
Machine Shop Turnings	*15.00
Bar Crops and Plate. ....	*25.00
Cast Steel. ....	*25.00
Alloy Free Turnings. ....	*15.00
Cut Structural. ....	*25.00

### Cast Iron Grades

No. 1 Cupola Cast. ....	43.00
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### Railroad Scrap

No. 1 Heavy Melting. ....	*28.00
Wheels. ....	*29.50
Rails, Random Lengths	*26.50

\*F.o.b. California shipping point.

## SEATTLE

No. 1 Heavy Melt. Steel	\$27.50
No. 2 Heavy Melt. Steel	27.50
No. 1 Busheling. ....	27.50
Nos. 1 & 2 Bundles. ....	27.50
No. 3 Bundles. ....	24.50
Machine Shop Turnings	21.00-22.50
Mixed Borings, Turnings	21.00-22.50
Punchings & Plate Scrap	35.00
Cut Structural. ....	28.00-28.00

### Cast Iron Grades

No. 1 Cupola Cast. ....	35.00
Heavy Breakable Cast. ....	35.00
Stove Plate. ....	30.00
Unstripped Motor Blocks	32.50
Malleable. ....	40.00
Brake Shoes. ....	35.00
Clean Auto Cast. ....	40.00
No. 1 Wheels. ....	37.50-40.00

### Railroad Scrap

No. 1 R.R. Heavy Melt. ....	28.50
Railroad Malleable. ....	30.00
Rails, Random Lengths	30.00-32.00
Angles and Splice Bars	28.50

## LOS ANGELES

No. 1 Heavy Melt. Steel	\$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles. ....	23.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	33.00-36.00

### Cast Iron Grades

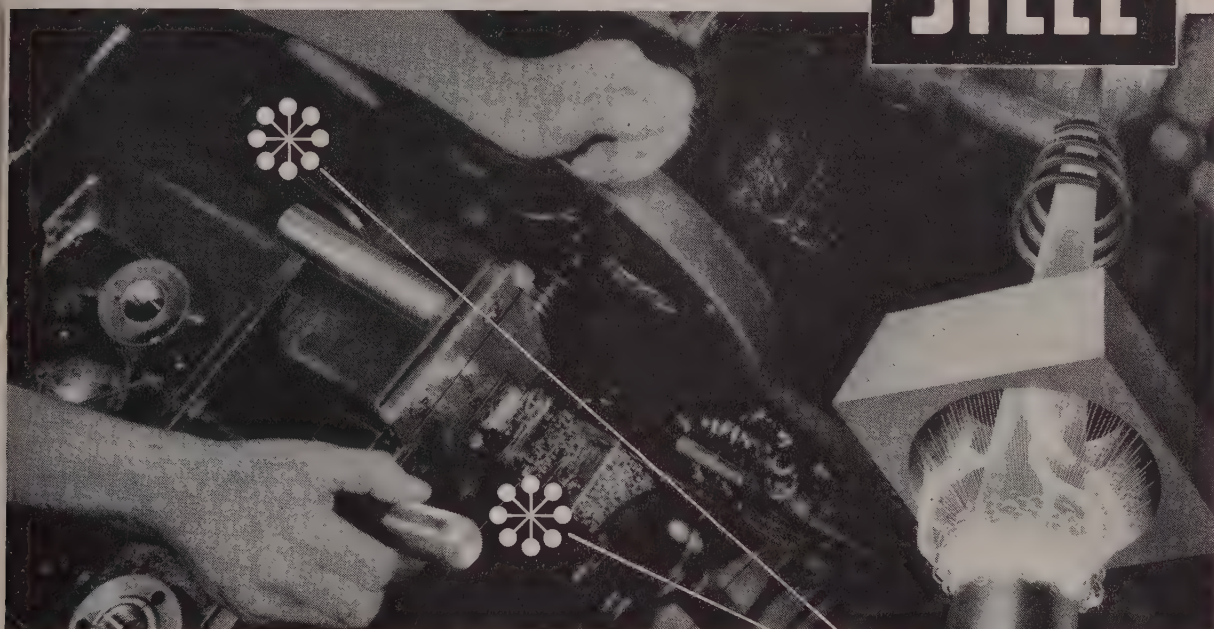
No. 1 Cupola Cast. ....	\$37.50-42.50
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## HAMILTON, ONT.

# Lundberg Screw Products Co. makes better studs at lower cost with

## J&L ELECTREAT COLD-FINISHED STEEL BARS

# J&L STEEL



Cutting precision threads on J&L Electreat Steel with a two-spindle threader at Lundberg Screw Products Co., Lansing, Mich.

**Steel costs are reduced 20% to 30% . . .**

**Heat treating of finished studs is eliminated.**

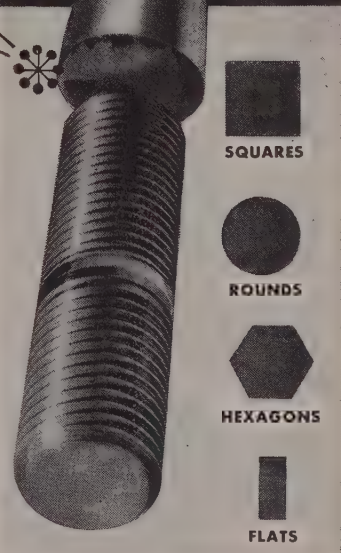
Steel studs made by Lundberg for such equipment as truck axles, farm implements and diesel locomotives, must be made to exact specifications.

By using J&L *Electreat* cold-finished bars to replace higher-cost alloys, such as chrome-molybdenum and chrome-nickel-molybdenum, Lundberg not only meets the customer's specifications but also obtains *two savings*: Steel costs are reduced, and the nuisance and expense of heat treating is eliminated.

In addition—finished studs are of better quality. They are free from scale and distortion caused by “batch” heat treating. They have clean, sharp threads. Inspection rejects are reduced.

Each bar of J&L *Electreat* cold-finished steel is individually heat treated at the mill by the electric-induction process under exacting control. The flexibility of heat control in the *Electreat* process permits “tailor-made” combinations of surface and core properties to fit your requirements.

Many fabricators of gears, couplings, bolts, nuts, shafts and other steel parts take advantage of these money-saving qualities of J&L *Electreat*. The booklet, “New J&L *Electreat* Heat-Treated, Cold-Finished Steel,” compares the properties obtained by the *Electreat* process with conventional “batch” heat-treatment and points the way to greater profits. Let us send you a copy.



Jones & Laughlin Steel Corporation  
404 Jones & Laughlin Building  
Pittsburgh 19, Pennsylvania

Please send me a copy of “New J&L *Electreat* Heat-Treated, Cold-Finished Steel.”

Do you recommend *Electreat* for:

NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_

## JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY and JALLOY (hi-tensile steels).

**PRINCIPAL PRODUCTS:** HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • “PRECISIONBILT” WIRE ROPE • COAL CHEMICALS



## Sheets Strip . . .

### Allegheny - Ludlum reduces prices on silicon sheets and strip, effective Feb. 15

Sheet Prices, Page 142

**Pittsburgh** — Allegheny-Ludlum Steel reduced silicon sheets and strip prices \$50 per ton on motor and dynamo grades and \$35 a ton on transformer grades, effective Feb. 15. Company also has established price of \$5.95 per 100 pounds on electrical grade silicon sheets. Previously company had no public price on electrical grade silicon sheets or strip. Company's new silicon sheet prices per 100 pounds, which are now competitive with other major producers, are as follows:

Grade	New	Old
Electrical . . . . .	\$5.95	
Dynamo:		
Motor . . . . .	6.70	\$9.20
Super . . . . .	7.50	10.00
Special . . . . .	7.50	10.00
Transformer:		
C (72) . . . . .	10.05	11.80
B (65) . . . . .	10.60	12.35
A (58) . . . . .	11.30	13.05

Sellers of silicon sheets report definite easing in demand for small motor and generator grades; demand continues active for transformer grades.

Some rejuggling in galvanized sheet allotments will be necessary because of the additional tonnage under the voluntary allocation program scheduled for shipment to manufacturers of grain storage bins. This program is said to involve 8400 tons of steel products monthly, of which 8000 tons constitute galvanized sheets in gages from 18 to 26. About 200 tons of heavier gage hot-rolled sheets and 200 tons of hot-rolled bars also are involved.

While enameling sheet requirements are off among stove, refrigerator and washing machine manufacturers, output continues to fall substantially below overall requirements. In recent years the market for enameling sheets has broadened considerably, now including many more end uses, such as signs, dispensing units, and for housing.

Present practice of some producers in pricing cold-rolled sheets under 24 inches wide on cold-rolled strip price card is expected to be abandoned when competition becomes keener.

Bethlehem Steel Co. has issued a new extra card on hot-rolled strip dated Feb. 1. The new card supercedes schedule published Oct. 10, 1947, and incorporates upward revisions of \$8 to \$10 a ton in size extras; \$2 to \$7 on pickling extras; \$2 to \$4 on cut length extras; \$5 on heat treatment extras, \$2 on back coiling and special killed steel extras. Company's revised hot-rolled strip extras vary considerably from pattern recently established by Sharon Steel Corp., Sharon, Pa.

**New York**—Sheet consumers generally continue to receive less tonnage than they can use; nevertheless, they are not nearly as interested in premium tonnage as they were, even at reduced prices. For instance, a substantial tonnage of hot-rolled pickled sheets, the result of a conversion deal, is being offered at

around nine cents eastern mill, without any takers being reported thus far. The tonnages ranges from No. 12 to No. 16.

Noticeable is the broadening trend among manufacturers of consumer durable goods, especially for household application, to shift from their more expensive lines to cheaper lines. In several instances here recently there has been some delay in shipping instructions on steel as a result.

Another trend is the disposition of sellers, in establishing quotas for shipment after this quarter, to set up allotments on a monthly rather than a quarterly basis. Practically all producers are now following this plan, as it makes for greater flexibility under the conditions that are expected to prevail.

However, in certain of the specialties, where ample capacity appears available, this is not so true. For instance, in electrical sheets and in stainless strip and sheets, producers are willing to book ahead as far as consumers desire, at least three months ahead. In the case of electrical sheets, as a matter of fact, a greater lead time is necessary than for the ordinary run of tonnage, so that sellers would almost have to accept tonnage at this time for as late as May.

**Boston**—Sheet consumers are more selective in buying and some including warehouses, ask for notification before shipment against old orders. Limited lots of spot tonnage available are less easily sold. Inventory adjustments are accompanied by scattered cutbacks and cancellations and easing in flat-rolled caught most distributors off guard. Indications are second quarter allocations will be combed more selectively by users who are now turning down off sizes and unwanted grades. Galvanized, already short in supply is tightening further due to voluntary distribution for grain storage bins. Stainless demand is light. One producer has withdrawn cold finished from relatively new accounts, reflecting reductions in tonnage quotas. Cold strip schedules are undergoing revisions due to unsettled hot strip supply and cutbacks.

**Chicago**—Attitude of many that mill-priced steel inventories are as good as money in the bank is regarded by some industry observers as the reason for sustained strong demand. Buying caution, which has become extremely pronounced in most finished products and many raw materials, does not extend to steel for this reason. Assuming this to be true, it could be the cause at some unpredictable future date for a swift disappearance of mill orders by cancellations, and the traditional feast-or-famine cycle for the steel producing industry would be perpetuated. Industry men who are fearful this will be the case believe it could be prevented by adoption of the same inventory consciousness now prevalent in specialty steels and other products. Two district warm air furnace and duct work manufacturers have reportedly canceled all orders for aluminum which they have been using as substitute for steel, now being able to meet their requirements with mill steel. Their industry is understood to have become keenly competitive and price inducements are being given in the form of extended

discount periods. Further signs of retrenchment in building activity are seen among hardware producers, at least two of whom have reduced their work-week from 50 to 40 hours as a direct result of declining order backlogs, and in steel sash and lath producers, one of whom says prices of the former have been cut to stimulate demand.

**Birmingham** — Tightness in sheets continues even to the point of remaining on what mill interests describe as the "critical list." Tennessee Coal, Iron & Railroad Co. has made no formal announcement of acceptance of its cold reduction mill at Fairfield, although it is known considerable tonnage has come from the new development. Output of strip is maintained on a fairly full schedule.

**St. Louis** — Cancellations of sheet orders continue to flow in, but they invariably are from the smallest consumers, usually carload-lot buyers, and are immediately taken up by others. Major customers generally talk "hard times" but press hard for all the sheets they can get. Demand in this district is supported by the earlier withdrawal of big outside producers to serve areas more favorably situated freightwise. Cancellations and hold-up instructions are spotty and are most prevalent in the appliance field. Conversion deals are on the wane too, but not entirely gone. One such order was recently canceled here, but another manufacturer promptly offered to take it over and pay the full cost of shipping the hot-rolled coils and of local cold mill reduction.

**Los Angeles**—Demand for virtually all flat-rolled products is strong, and supplies show very little improvement. Activity is perking up somewhat among smaller manufacturers, who in recent months have comprised a soft spot in the market. Many of these small consumers of sheets and strip continue to operate on a curtailed basis, but others sense some improvement in the business atmosphere and are beginning to specify on a more substantial scale.

## Steel Executive Optimistic

**Philadelphia** — John T. Whiting, president, Alan Wood Steel Co., Conshohocken, Pa., is optimistic about the present outlook for his company. He said that January results compared favorably with those of January, 1948; and that the company is operating at as near full capacity as possible and that operating costs have remained relatively stable.

"Demand for all of our major products has continued heavy," he is quoted as saying in the *Philadelphia Inquirer*. "We have had few deferments, but no cancellations of orders, and, although some of our customers are not pressing us as hard as they were last year for deliveries, they have all been taking their quotas."

He pointed out that completion late this year of the company's new \$8,900,000 hot-rolled strip mill would mark an important step in its program for greater diversification. This mill he added, will not only enable the company to add narrow hot-rolled steel strip to its line of products, and increase its rolling capacity, but turn all of its ingot production into finished steel.



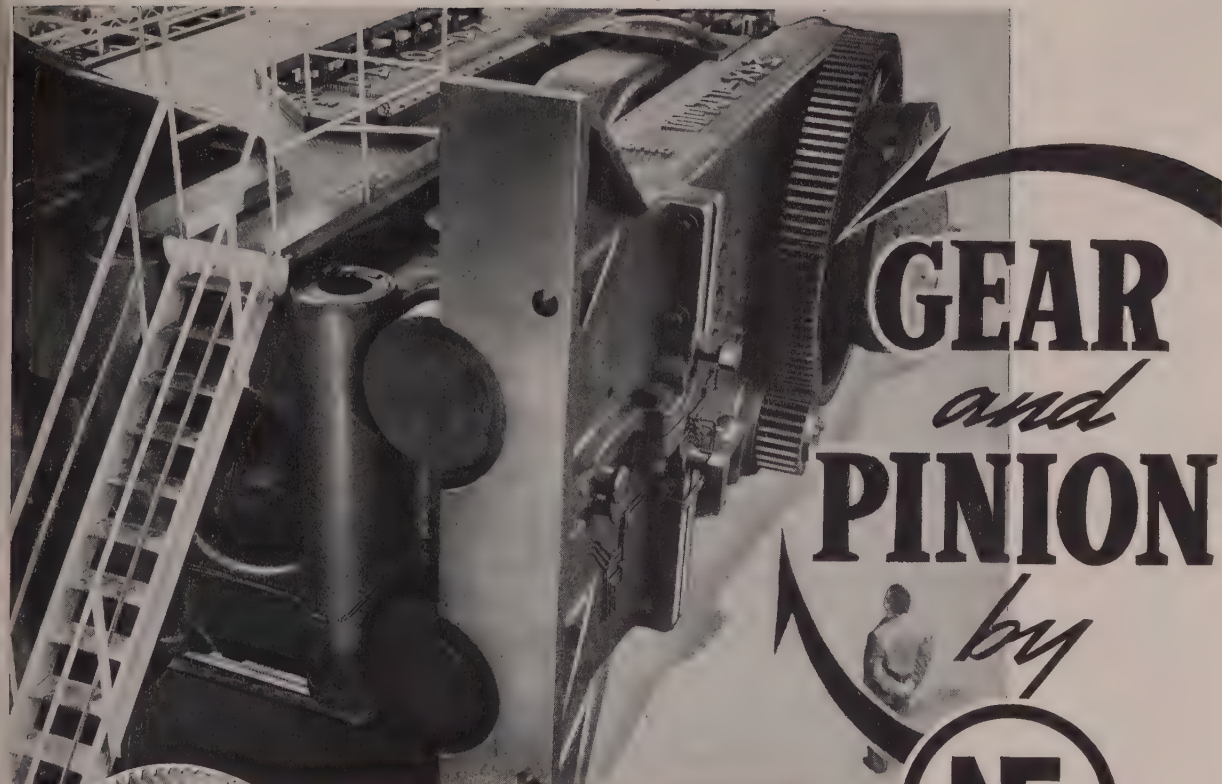


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## Plates . . .

### Opposition to administration of voluntary allocation program increases

Plate Prices, Page 143

**Chicago**—Although several district plate fabricators continue occupied through next year on major construction projects, an increasingly large number is actively seeking business. Close relationship between dependable supply of steel and ability to bid on new jobs has intensified bitterness of some fabricators toward certified users in the voluntary allocation program, a number of whom, according to an informed observer, are getting much more steel than necessary to support present reduced levels of operation. This source charges that barge producers have made craft for which there are no buyers at this time. Furthermore he contends that present needs of railroad car builders are 25 per cent lower than receipts under the allocation program.

This assertion seems to be borne out in mill reports of some car builders deferring deliveries of plates, in one case to June. Further support for the contention can be drawn from a change which has occurred with respect to "pool tonnage," the procedure used by mills in the final quarter of last year and the present quarter by which rolling schedules were set up without firm orders having been received from all members of the industry. To date, all steel produced under this plan has been taken by the industry, tonnage going to the individual companies which needed it at the time. Now one local mill is not scheduling tonnage on this basis for second quarter, preferring to keep informed of the industry's needs on a monthly basis rather than risk overproducing in event of substantial cancellations.

A proposed voluntary allocation plan, largely involving plates, has aroused a large segment of the fabricating industry against the OIC for what is considered to be a deliberate attempt to force overstatement of the need for the program. The proposed program is that for petroleum bulk storage. Fabricators, contacted by wire by OIC, were asked to state by Feb. 14 steel requirements of storage tank work on which they have been asked to figure. If these replies are to be used by OIC in figuring tonnage requirements of the proposed program, as industry men think they will be, the resulting total apparently would be overstated in the exact multiple of the number of fabricators figuring on a given job. Thus, in the opinion of several interests, a false impression of the essentiality of the program would result. Trade suspicion is that OIC is seeking to prolong allocations and strengthen the administration's case for mandatory controls.

**New York**—Although plate buyers are showing little interest in gray market steel, they are still paying the higher prices quoted by some of the smaller mills. They also are trying to get away from these latter prices, but have been having little luck to date. They find spot openings

upon occasion, but usually have to pay the higher price, if the mill is a premium mill.

Meanwhile, producers generally appear confident they will have no difficulty in maintaining operations throughout the second quarter and probably the third quarter as well. Most, in fact, are optimistic over prospects for the entire year.

One of the softer spots in the general outlook is in the railroad field. Car demand has slowed down noticeably over recent weeks. As a matter of fact, the general overall trend has been down over the last few months, barring one or two especially outstanding orders. Little new equipment is now being figured and, if business remains at low ebb for the next several weeks, there is even a possibility that present allocations of approximately 250,000 tons of steel, including 112,000 tons of plates, will be reduced before the end of the second quarter.

Steel sellers have promised to go along on the present basis of allocation provided there is sufficient car work to justify it. But if there isn't it is believed that most producers will feel under no obligation to maintain shipments at the rate now set up under the voluntary allocation program.

Actually, there have been some freight cancellations of late and also some cancellations by the railroads of steel primarily earmarked for maintenance and repairs. There has been a decline in this latter type of work which also is reflected by curtailments at various railroad shops and subsequent laying off of men.

Tank makers report some decline in backlogs; however, most are booked up from nine to twelve months or so on the basis of present operations, which are still lagging, they say, because of inability to get sufficient steel, particularly plates. They point out that the decline in bookings has been due principally to less industrial work; also fabricators report less demand from the oil companies for large line pipe. However, none seem much concerned about business prospects for the remainder of this year. Rather, their concern is primarily with the problem of getting an adequate amount of steel without having to augment purchases with premium materials.

**Boston**—While demand for plates has eased in some directions, slack is minimized by lack of tonnage and fabricators are usually in need of more volume. Tank shops continue to press for light plates and shipbuilding requirements are gradually mounting. Close to 40 per cent of plate capacity is still under voluntary allocation and with pipe line commitments heavy, open volume for general distribution is restricted. Structural shops are absorbing plate quotas without difficulty. More consumers are watching cost sheets more closely and are less willing to cover with premium tonnage. Floor plate demand is well maintained.

**Philadelphia**—Stringency in plates is indicated by the fact that one large producer has not yet opened books for the second quarter, or any part thereof, and that at least two other producers have taken no action beyond April. Consumers are hopeful that as the new period gets under

way there will be a loosening up, but producers offer little encouragement. Demand for light oil storage tanks for domestic and distribution purposes has eased, but requirements for pressure tanks are as heavy as ever and there is still talk of a new voluntary allotment program for large oil storage facilities. This may come up for discussion at a meeting of the Steel Advisory Committee in Washington on Feb. 24.

**Los Angeles**—Requirements for large-diameter pipelines, public water projects, and public and private hydroelectric generating plants, are keeping fabricators busy and plate demand as strong as ever. Consolidated Western Steel Corp. has begun regular deliveries of 30-inch pipe for the Texas-New York gasoline. Latest shipment of 100 carloads, comprising 2500 tons of fabricated pipe, accounts for 10 miles of the 1840-mile pipeline. Scheduled for completion in 1951, the project will require 470,000 tons of steel.

**San Francisco**—No let-up in plate needs is apparent. Heavy pipeline fabrication continues to absorb large quantities of West Coast-produced heavy products.

## Tin Plate . . .

Tin Plate Prices, Page 143

**Pittsburgh**—Tin plate producers are experiencing little trouble in lining up full production schedules throughout second quarter. A few scattered hold-ups in second-quarter tonnage are reported, but these represent relatively small requirements and sellers have no difficulty in finding new customers for tonnage canceled. Tin plate producers expect little change in the overall demand for tin mill products throughout most of this year. If any measurable change does occur, it probably won't be felt until fourth quarter. Tin mill product inventories among both consumers and producers are not excessive, a condition which is expected to be an important factor in the event of slight easing in demand. Export of tin plate throughout second quarter is expected to record little change, with dollar shortages the main limiting factor in a few instances.

Regulations governing coating restrictions for pet food cans have been revised to permit use of 0.25-pound electrolytic coating. Previously bonderized black plate only was permitted for this end use, except where consumers were granted special permission to use 0.25-pound electrolytic by government authorities.

One large can company recently was granted permission to use 0.25-pound electrolytic tin plate for top ends of coffee cans because of difficulty experienced in soldering "opener key" to the container which, because of governmental regulations, must be black plate. It is assumed other can companies will seek similar permission to use electrolytic in instances where soldering problems have arisen. This also brings up question of the adequacy of welded seams on the body of black plate containers. It is not to be concluded the use of electrolytic for top end of coffee cans is a forerunner of a general easing in coating regulations in near future.

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It will continue to take *teamwork*, but if we work together, there's no limit on what we can all *share together* of even greater things.

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## Structural Shapes . . .

**Steel needs falling, but still heavier than mills can handle. Fabricators' backlogs are large**

Structural Shape Prices, Page 143

**Philadelphia** — Steel requirements are not as heavy as they were, but they remain heavier than mills can handle. Structural steel demand is featured by 35,000 tons of structurals for the Maryland state Chesapeake Bay bridge, on which bids are to be closed Mar. 8. This project also will require 5500 tons of reinforcing steel. New inquiry otherwise is light.

Meanwhile, fabricating shops, except for some of the small ones, report backlogs equivalent to five to six months' work. Shape makers foresee considerable work for some months ahead. Bolstering structural requirements is a good demand for small shapes for various product assemblies due to growing application of welding. These requirements are much heavier than prior to the war.

"A few oil companies have deferred structural orders that were scheduled for production in 1950," an official of the Belmont Iron Works, Philadelphia, said recently, "but no orders have been canceled and no work has been suspended." Company backlogs are now slightly below the \$7 million mark reported on Dec. 1, 1948; however, export business has shown signs of increasing and this should bolster unfilled orders. Last year 18 per cent of the company's business represented export sales.

**Boston**—Delivery is a factor on more structural projects in placing steel contracts; several have been awarded on that basis. Public works programs call for early delivery, in one case April for a small bridge. This proviso was met by swapping stringer spans from one job to another. Inquiry is slightly heavier, notably for small bridges. Nearly 30 per cent of new tonnage up for estimates includes power plant expansion, the largest award being for 3500 tons, power station at Weymouth, Mass.

**New York** — Apart from public work, little structural business is being placed; nor is there much new inquiry. Fabricators claim there have been few withdrawals of work where it had once reached the bidding stage, but that various projects in the tentative blueprint stage have been held up. An outstanding inquiry involves approximately 35,000 tons for a state bridge over Chesapeake Bay in Maryland.

## Tubular Goods . . .

Tubular Goods Prices, Page 143

**Pittsburgh** — Reports that some tubing producers are no longer strictly adhering to mill price basis has not been confirmed among interests in this area. At least one producer in the Midwest is reported not to have changed its pricing policy on welded stainless steel tubing from basing point system. Sellers note continued leveling off in demand for all tubing

classifications, notably for alloy and stainless. In some instances, deliveries are available within 2 to 3 weeks for more common grades of stainless tubing, while 6 to 8 weeks' delivery is available on some alloys. Boiler tubes remain under strict allocation, although railroads are no longer accepting full mill allotments. Producers have recently opened books for second-quarter order acceptance of hot-rolled mechanical tubing. Schedules were quickly filled through April and May; some openings in June still are available. At least one interest has not opened books for cold-drawn mechanical tubing tonnage since last September.

**Boston** — While some pipe mills are about current on butt weld products, seamless schedules are overcrowded. Earlier blankouts are beginning to show up in deliveries which are nearer promises in more instances. Hot-rolled mechanical tubing, four inch and over, is being scheduled for June shipment, but small diameters and cold-finished are much more extended. Pressure tubing schedules are in third quarter with some allocations slightly larger. For most part, however, pipe continues on allocation at lower levels established by reductions put into effect last year.

**Los Angeles** — Demand for large-diameter pipe seems insatiable, and some fabricators are booked ahead for several years. Supplies of small-diameter tubular products show improvement. Price resistance in this case is a growing factor, particularly in high-priced items for residential construction. Buying by the major oil companies generally remains limited, with production cut-back to reduce over-large stocks of crude. Nevertheless, the requirements of independent producers, several of whom have major exploitation projects under way, are expected to take up much of the momentary slack. Long Beach Oil Development Co., for example, is launching a substantial program of tideland drilling in the harbor area.

**San Francisco**—The first shipment of large diameter pipe for the world's longest pipeline has been started from California to Texas. The natural gas line, being constructed by Transcontinental Gas Pipe Line Corp., will stretch from Texas to New York and will supply the eastern metropolis with gas from Texas and Louisiana fields.

The 30-inch steel pipe is being fabricated by Consolidated Western Steel Corp., a U. S. Steel subsidiary, and

## Will Boost Furnace Capacity

**Birmingham**—Tennessee Coal, Iron & Railroad Co., this city, is blowing out its No. 7 blast furnace at Fairfield, Ala., for complete relining, overhauling and enlargement. The company will increase the capacity of this furnace to 1175 tons from 1025 tons, making it the largest furnace in the South. The job will require about 65 days. No. 7 blast furnace has produced 2,485,000 tons of iron since its completion Apr. 29, 1942. steel is being supplied by Kaiser Co.'s Fontana, Calif., mill. More than 470,000 tons of steel will be needed to complete the 1840-mile pipeline.

## Steel Bars . . .

Bar Prices, Page 142

**New York**—Consumers, including some of the larger ones, still complain of difficulty in obtaining an adequate amount of hot carbon bars. Some need less tonnage and in certain instances have made deferments, but in general pressure is still on for more tonnage than they are receiving.

One leading eastern producer last week set up quotas for second quarter, being among the last to have taken such action. In this case, as well as that of other producers, allotments are on about the same basis as now exists. Consumers are hopeful that the easing in steel supply generally will be reflected in greater degree in carbon bars before summer, but admit that there is little tangible to date on which to base this hope.

Meanwhile, the situation in cold-drawn carbon bars remains fairly easy. Most cold drawers appear confident that they will be able to sustain operations throughout the second quarter at as high a rate as the hot carbon bar supply will permit; nevertheless, they still have capacity open for that period. Alloy bars, both hot and cold, are in much easier supply than the carbon grades.

**Pittsburgh**—Cancellations or hold-up of orders for alloy bars continue to represent relatively small tonnages, and sellers find little difficulty in filling openings in production schedules that have occurred. Current order volume from automotive interests remains unchanged, although it is recognized this situation can change almost over night. A few cancellations are noted, even among petroleum industry customers for oil well drill collars, sucker rods and bits. Cold-finished bar interests report customers are considerably more inventory conscious than a few months back, a condition which has resulted in some order cancellations. However, cold-finished bar sellers contend output continues to fall substantially behind demand. Production schedules remain restricted to limited supply of hot-rolled bars.

**Boston**—Some first quarter carbon bar tonnage has been cutback—with indications users in scattered instances will not take up second quarter allocations in full. While this tonnage will probably be moved to others, the fixed distribution under the quota system appears to be cracking and more elastic. Forge shops with government work, direct or indirect, are active, but those closer to tool and truck outlets are less active.

**Chicago** — Construction equipment manufacturers are not responding in a uniform way to present lag in demand, some now producing for stock in anticipation of an upturn with spring weather and others curtailing production until the direction of the business wind can be gaged. One district forger reports having had order cancellations from a majority of the leading independent automobile producers, but says these have been offset by increased demands from the big three and one independent producer.



## Wire . . .

Wire Prices, Page 143

**Pittsburgh** — Some revamping in operating schedules by some wire producers has been necessary as result of realigning of distribution pattern with emphasis on strengthening position within logical marketing areas. Despite fact many consumers are willing to pay high freight charges, with price of secondary importance, sellers contend such will not be the case in more competitive times. Similarly producers will not be willing to absorb exorbitant freight charges under similar competitive conditions, even if permitted to by law. This realignment in distribution pattern occasionally results in temporary openings in production schedules. However, such openings should not be interpreted as representing decline in demand to that extent. In most instances this reshuffling of customer relationships soon winds up with production schedules once again filled over the projected allotment period. Some softening in demand, however, is noted for spring wire for the upholstery trade, and unconfirmed reports indicate some of the smaller wire producers are no longer strictly adhering to mill pricing policy in seeking new business on a competitive basis. Demand for fence and barbed wire has returned to near normal seasonal basis. Jobbers' stocks of merchant wire items are at the best level in months. If production should be retarded at the mill, some jobbers could be caught short in meeting anticipated sharp increases in demand this spring for merchant products.

**Boston** — Wire mills are generally scheduled for April with backlogs substantial and demand easier in more directions. Cold heading wire buying reflects balancing of inventories by screw and fastener manufacturers; backlogs on these products are lower and demand for heading wire next quarter will parallel actual production schedules. With exception of bed spring and upholstery wire, most products continue on quotas which for some items will be heavier. Rod supply has improved slightly.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 142

**Seattle** — Rolling mills are operating at full capacity, reinforcing constituting bulk of the output, although merchant bars continue in a strong position. Small tonnages are being booked freely, but conditions are changing from a sellers' to a buyers' market. While no outright contract cancellations are reported, there are instances where buyers have reduced tonnages previously placed. Public construction works furnish the bulk of new business as private construction appears to be slowing. Unfavorable weather has caused finished materials to accumulate at source thus upsetting delivery schedules. No large contracts are immediately pending.

## Ferrum Iron Powder Eases

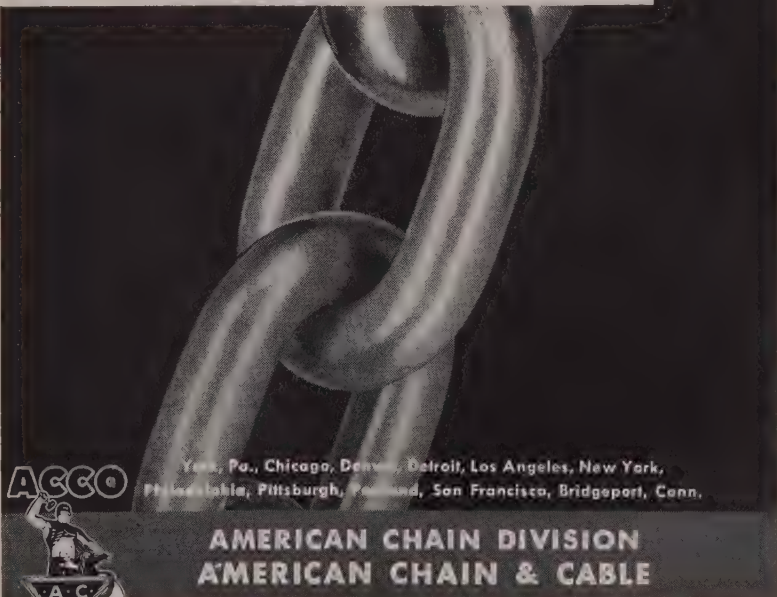
**New York** — Charles Hardy Inc., this city, has reduced its prices for ferrum iron powder, effective as of

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Feb. 7. The price reduction was made possible by increased demand and expanded facilities, according to the company. The new prices on the basis of cents per pound, packed in waterproof bags, ton lots and over, delivered, are as follows: Ferrum iron powder, Type 1, 10.00c; ferrum medium-carbon steel powder, 15.00c; ferrum high-carbon steel powder, 15.00c; ferrum 8 per cent copper-iron powder, 12.50c; and ferrum 18 per cent copper-iron powder, 16.00c. Prices for powder packed in steel drums are 1/2-cent higher.

## Warehouse . . .

Warehouse Prices, Page 145

**Chicago** — On the surface, pressure on most warehouses for increased steel deliveries is unrelenting, but the undertone has weakened, the lists of items desired by purchasing agents having noticeably shortened to the point where the same number of customers require considerably less steel. Demand is still strong for prime sheets, strip, plate, pipe and structurals, but has eased somewhat on bars. Rearmament, particularly aircraft procurement, has not resulted in the expected upsurge in demand for alloys of aircraft quality, and slackening demand from the appliance and machine tool industries, in addition to upset schedules in automobile components buying due to model changeovers and heavy truck output curtailments, has weakened the position of this product.

**Cincinnati** — Steel jobbers experience a progressive tapering in inquiries, although they still fail to attain a balance in supply and demand. Mill shipments to warehouses have not improved, and stocks continue badly out of balance. There is an increasing trend, by customers, toward refusal to accept substitute material.

**Los Angeles** — Jobbers report a small but noticeable change for the better in business sentiment among their customers, and a consequent pickup in new orders. They ascribe this to a little more optimistic outlook among smaller manufacturers, some of whom had been almost completely out of the market the past six weeks. Although sheets and plates remain tight, jobbers' inventories of most other items are somewhat improved.

**Seattle** — Jobbing demand continues depressed due to weather conditions, which have closed many logging operations and other outdoor pursuits. Normal spring requirements are expected to develop shortly. Bars and structurals are reported in improved supply, and alloys are being offered more freely by producers.

## Israel Gets Austrian Steel

**New York** — A bolt and nut maker from Israel, now in this country to buy equipment for plant expansion, claims that he is buying most of his steel in Austria, and at a price on bars and wire rods of about \$12 a ton under American quotations.

This interest, discouraged by the long deliveries quoted by American manufacturers of bolt and nut equipment (in certain cases 18 months or more) is endeavoring to purchase used machinery, but with little success to date.

## Pig Iron . . .

Pig Iron Prices, Page 144

New York — While pig iron producers can still sell more iron than they have available, there is admittedly a further easing in pressure, especially where premium prices are involved. This is reflected in particular in demand for foreign iron, which is now at a virtual standstill. The sharp drop in cast scrap prices here to a level below pig iron is a factor in the easing pressure for iron, in addition to continued restrictions in castings output, particularly at the jobbing foundries.

Pittsburgh — Some jobbing foundries report slight improvement in new order volume, perhaps brought about by price concessions on castings, ranging generally from 10 to 15 per cent. Merchant iron supply shows no signs of matching demand until late this year at the earliest. It is possible that by that time the iron supply situation in other areas may have eased to the point where shipments again will be resumed to Pittsburgh customers as in prewar period. Increase in basic iron supply for Pittsburgh consumer is reported.

Carnegie-Illinois Steel Corp. blew out its No. 5 blast furnace at Duquesne Works, Feb. 14, leaving 45 out of 47 units active in this district.

Boston—Pig iron consumers in more cases are insisting on closer analysis as supply improves; small jobbing shops are not melting as much and backlogs with larger consumers are lower, although melts with the latter are maintained. Developing from more balance in raw material supplies are better quality castings and improvement in workmanship. Fair volume of iron bought at \$80 and more a ton is being worked down, although analysis is off frequently.

Philadelphia — Melting of foundry iron has declined due to further slight easing in foundry operations and to the relatively low prices now being quoted on principal grades of foundry scrap. However, domestic iron producers, particularly in view of the strong demand for basic iron, are able to move all their output.

Cleveland—Even though foundry operations have been curtailed, demand for pig iron continues strong, with one seller reporting an acceleration in requests for February delivery. With a lower rate of operations, foundries as a whole are taking all the iron they can get and using it in lieu of scrap, which has been higher priced. This action has helped cut scrap prices, No. 1 cupola cast now being only about \$4 above pig iron.

Buffalo—Easier tendencies are becoming more widespread among foundries throughout the western end of the state. A large number is now operating on curtailed setups with many down sharply. Despite melt cutbacks, leading merchant iron sellers still have no trouble in finding outlets for capacity production. However, it was noted that an increased volume of iron was moving to Michigan motor casters who were reported taking up any gap in output that resulted because of a tapering off in local operations. Railroad casters also

# Arc welding helps cut fabricating costs of long span joists

LEACH STEEL CORPORATION, a prominent steel fabricator of Rochester, New York, had a problem fabricating several hundred steel joists running from 30-foot to 64-foot lengths. The established method of construction seemed too costly of both time and steel.



La Motte Grover, Airco Technical Sales engineer assisted in developing technical details and shop methods for welded fabrication. Airco Nos. 87 and 78E electrodes were recommended.

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"Welded construction provides greater freedom in structural design. It saves steel, time and money in fabricating built-up members. Further, a better appearance of exposed steel work is obtained, due to smoother surfaces and outlines."

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continue active, although one car wheel maker reported a slight letup in demand.

**Cincinnati**—Demand for pig iron is spotty, but still in a volume in excess of shipments into this district, either from northern or southern furnaces. The melt is lighter, but inquiries for pig iron are no gage thereof; in recent months the proportion of scrap was far above normal, and now melters are trying to use more pig iron. When foundries hold up shipments, the tonnage is readily diverted to others.

**Birmingham** — Some evidence of the slowing down in foundry operations is reflected in the pig iron sup-

ply situation. Best opinion is that while the slackening here and there makes supplies "somewhat easier" the overall demand for iron is nowhere near being met, especially so long as pipe plants continue to be booked to capacity and for some months ahead.

**St. Louis**—Demand for pig iron continues heavy despite spotty cancellations of orders which are promptly placed elsewhere. With easing in foundry use most consumers are in comfortable condition, although without stockpiles. Pig iron producers are wondering what effect dropping scrap prices will have on their demand. On the up side, however, is the fact that

several foundries are finding demand for their products on at least a temporary upgrade. These foundries' customers had found themselves overstocked with castings and withdrew orders until the excess stock could be worked off. That has been done now and they are reinstating orders with the foundries. Others have exhausted foreign iron supplies and are back in the market for local pig.

**San Francisco**—Cutback in Kaiser-Frazer automobile production has resulted in diversion of more pig iron to the West Coast. Kaiser-Frazer's Ironton, Utah, blast furnace is now shipping pig to the West Coast that formerly was sent eastward to supply Kaiser-Frazer with steel for its autos.

## Iron Ore . . .

Iron Ore Prices, Page 144

**San Francisco** — Railroads which operate in Utah have asked the Utah public service commission to allow the maximum rate increases on iron ore traffic granted last July by the Interstate Commerce Commission.

The ICC order permits an increase of 34 cents per gross ton, but the Utah commission in December authorized an increase in intrastate rates amounting to only half of the ICC-permitted boost. The railroads now are seeking the full 34-cent increase on intrastate haulings.

Geneva Steel Co. would be most affected if the higher rate is granted. It ships approximately 80 per cent of the Utah intrastate iron ore tonnage. The sole other shipper of iron ore is Kaiser-Frazer Parts Corp., accounting for the remaining 20 per cent.

Neither company has stated any opposition to granting of the maximum rate.

## Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 145

**New York**—While demand is off as compared with last fall, bolt and nut makers nevertheless report a better business so far this month than in January, and claim they could step up operations substantially if they had more steel. One eastern bolt and nut maker is unable to work on more than a 36-hour weekly schedule and others report somewhat similar situations. Wire rod supply is easier, they claim, but when it comes to carbon bars the situation is still "tough." Also, bessemer steel is not much easier than it was, they say.

One contribution to the recent betterment in bolt and nut demand is an increase in specifications from India and certain other countries in the Far East, in position to obtain dollar exchange through the exportation of commodities badly needed in the United States. However, there is little demand from South America due to dollar shortage, and European countries are in somewhat better position to meet their own needs than heretofore. In fact, there has been at least one case recently where they have competed successfully for American business. The case is that of a British maker which sold a sizable tonnage to an American oil company.

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## Scrap . . .

Strip Prices, Page 143

**New York**—Scrap brokers' buying prices are nominally lower, with little actual trading on which to base the market. No. 1 is off to a range to \$31-\$32, f.o.b. shipping point; No. 2 heavy melting steel, No. 1 busheling and No. 2 bundles, \$29-\$30; and No. 1 bundles, \$31-\$32. No. 3 bundles are available at \$26-\$27, although the actual flow of this material is virtually nil.

As collections continue to taper, as a result of the general decline in prices, and as major consumers have been out of the market for some time, drawing on old contracts and inventories, there are an increasing number in the trade who believe that the downward trend has about run its course. In fact, it would not prove surprising if a reversal set in fairly soon, especially if the present abnormally warm weather gave way to more seasonal conditions.

Cast grades also are tending downward, with No. 1 cupola at \$38, f.o.b. shipping point; charging box cast, \$36-\$37; and unstripped motor blocks, \$34. Heavy breakable is unchanged at \$36. Malleable cast has experienced the most precipitous drop of all grades, declining from \$82 or \$83 only a few weeks ago to \$45 or possibly less at this time with little interest on the part of either buyers or sellers. Machine shop turnings and mixed borings and turnings have been advanced to a range of \$25-\$25.50, f.o.b. shipping point; short shovel turnings, to \$27-\$27.50.

**Pittsburgh**—Representative tonnage purchase of dealer open-hearth scrap and No. 2 bundles at \$37 per gross ton, and at \$39 on independent negotiated basis for industrial heavy melting steel crystallizes quotations for these grades in a market which continues to show signs of further easing. Some brokers claim to be having difficulty in filling the \$37 orders, principally because of relatively large tonnage still outstanding on old orders for delivery at \$39. Once these higher priced orders are shipped, little difficulty in accumulating scrap for shipment at the lower price level is anticipated. While substantial tonnage of short and mixed turnings is still outstanding on old orders at a price range of \$34.50-\$35.50, yard dealers claim ability to buy freely at \$31 to \$32 for short shoveling and \$30 to \$31 for mixed borings and turnings. Cast grades remain nominal with last sale of No. 1 machinery at \$60, for example, considered well above probable price of next representative tonnage purchase. Despite lower price levels for cast scrap grades, many foundries have not yet altered scrap-pig iron melting ratios significantly. Should cast scrap offering prices continue to fall, it would appear logical that pressure for pig iron would ease to extent consumption of cast scrap would be increased.

At least one mill has lowered its bid price for railroad heavy melting steel \$2 a ton to \$40, restoring the normal \$1 differential over industrial heavy melting steel scrap price.

**Boston**—Price weakness marks the entire scrap list, open-hearth and cast grades, with further declines in heavy melting. There are few out-

standing orders and new buying is listless. Cast is notably dull and lower prices are no attraction with inventories of high cost scrap substantial in numerous cases. Close inspection prevails on what little tonnage is moved.

**Philadelphia**—Demand for steel scrap remains quiet with prices unchanged, except in mixed borings and turnings which are off slightly to a range of \$31-\$31.50, delivered. In cast grades, charging box and heavy breakable prices have been reduced to a spread of \$42-\$43; unstripped motor blocks, to \$38-\$38.50. No. 1 cupola cast is unchanged at \$45 delivered. (Due to a typographical error

this grade was quoted in the Feb. 14 issue at \$55.)

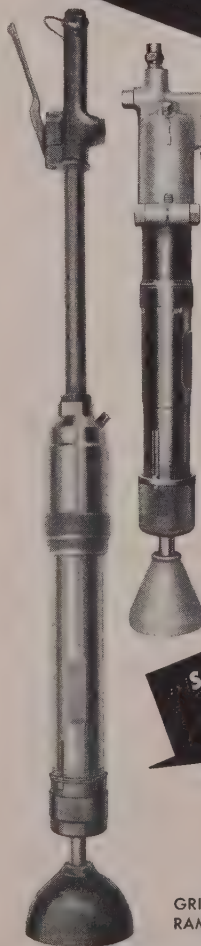
**Cleveland**—Major consumers continue to refrain from buying with a result prices on some steelmaking, blast furnace and foundry grades slipped down further last week. Borings and turnings eased off \$1 to \$2 and low phos \$1.50, while No. 1 cupola cast dropped \$5, malleable \$10, and other foundry grades \$2.50. Some quotations were merely nominal in the absence of sale of sufficient material to establish a price.

Reflecting the improved scrap inventory position of consumers, one major steel company has instructed its mills to return to prewar prac-

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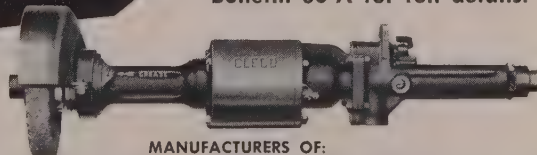
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tice of rigid inspection and grading of incoming shipments of scrap. This consumer is out of the market until at least Mar. 1.

**Buffalo**—An additional \$2 to \$3 a ton was added to the sharp plunge in the scrap market here during the week. Dealers' attempts to obtain new orders even at the drastically reduced prices met with no success. Steelmaking items were offered to a top mill at \$35 a ton, which compares with a range of \$37-\$38 a week ago, but the offer was turned down. Dealers here have not been caught in the slide with large stocks on hand. In many instances, dealers have profited by the recent setback. They have been shipping against old contracts placed around \$39 and \$40 for the steelmaking grades. Old commitments are being covered at lower prices established since orders were placed.

Indications point to new business being placed shortly as outstanding contracts expire during the current week. On the other hand, continued open weather has spurred the movement of scrap and mills have accumulated large stockpiles to carry them through a substantial part of the period from now until spring.

**Chicago**—Scrap buying, both by mills and foundries, is virtually nonexistent and shipments against only a very few old orders are still in progress, most contracts having expired. One railroad list is currently out for bids. Shake-down in prices continues with traders still uncertain as to what an active market will mean pricewise. Published quotations by and large remain nominal, with some revisions having been made in both directions.

**Cincinnati**—Scrap prices continue weak, with little consumer buying interest being shown. Borings and turnings are hit especially hard by the buying lethargy, and are quotable \$2 lower. Other scrap is nominally unchanged, although the trend appears to be downward, at least until melters return to the market and test prices. Open-hearth grades are moving steadily on old contracts. Foundry scrap is dull in reflection of light melt, slightly better iron supply, and adequate scrap inventories.

**Birmingham**—No changes in prices of scrap were posted last week, but the market continued a definite softening trend. Heavy melting at \$33 was in modest demand, but some sources that usually are on the buying end in scrap made some sales during the week.

**Dallas**—Steel scrap prices remain little changed following the sharp price drop of a month ago and activity on the market is slow, with buying offers markedly reduced. Dallas prices for open-hearth No. 2, off around \$7 to \$8 a ton in the break, remain about the same. Cast iron is practically at a standstill at \$18 to \$20 a ton.

**St. Louis**—Scrap quotations here continue to flounder as consumers remain out of the market. Recurring rumors that one or two big melters are about to buy "tomorrow" titillate dealers each week and further unsettle prices, but the sales never seem to materialize. Mills themselves now seem disturbed at the prospect they may all re-enter the market at the same time, boosting prices sharply.

Possibly on this assumption, one broker is reported to have paid \$40 for a quantity of No. 1 heavy melting steel, which would indicate an expectation to sell at \$42, even though the prevailing offering price of No. 1 hovers around \$38 and some melters claim they can get it at will at \$34. Conversion deals are helping to support the price of No. 1. On the basis of negotiations between brokers seeking to fill unexpired contracts, cast scrap weakened again last week \$2 to \$9 and some railroad items nearly as much. They cannot be regarded, however, as buying prices. Dealers' suppliers currently are shipping on open orders, waiting for sale price levels to be established. Mill inventories remain at 60 days or better and there is little prospect of substantial buying before Mar. 1.

**Los Angeles**—Prices for steel-making scrap are steady, following the recent reduction, with demand strong for good quality material. Mills are adding to their inventories, but buying selectively. District receipts are off since the downward adjustment in prices, some estimates of the decrease in supplies running as much as 30 per cent.

**San Francisco**—All major West Coast steel mills are actively negotiating for further shipments of steel scrap from the Pacific islands and the Orient. Indications point to an increasing inflow of war salvage material in coming month. Arrival of Pacific scrap earlier this month was an important factor in scrap price cuts of \$2.50 to \$4.50 a ton on leading grades a few days ago. The price reduction also was influenced by withdrawal of eastern mills from West Coast scrap markets. Price declines on scrap in the East have made shipping of western scrap uneconomical. Reduced foundry operations continue to exert a weakening influence on cast iron scrap prices. Foundry business is off as much as 50 per cent in some western cities, and cupola cast has dropped from \$67 last November to a nominal price of around \$43 currently. Open-hearth cast iron scrap is down to \$35 a ton from \$55.

**Seattle**—The recent drop of \$2.50, to \$27.50 per gross ton for No. 1 heavy melting, has not discouraged the movement of steel scrap which is arriving at the mills in good volume in spite of disrupted transportation. A shipment just in from Japan consists of excellent material, including forging blanks, unfinished guns and other high grade military equipment intended for war use. Dulien Steel Products Inc., Seattle, has two full cargoes en route from Japan to Houston, Tex., and other Gulf and Atlantic ports. Additional shipments destined for Pacific Coast mills of Bethlehem Pacific Coast Steel Corp., have been closed.

Local foundries are now paying \$35 for No. 1 cupola cast iron scrap which is available in ample tonnages for current needs. For several months this material was bringing \$45 and \$50. While pig iron is scarce, plants have sufficient inventory to carry in the meantime. Foundry operations are slow, some plants working only half time. Part of this condition is attributed to the weather although a definite slowing down is sensed.

# hot-dip GALVANIZING



## Rails, Cars . . .

Track Material Prices, Page 143

**San Francisco**—Columbia Steel Co., U. S. Steel Corp.'s principal western subsidiary, has started production of rail tie plates at its Southern California mill at Torrance. The output of the California mill is designed to supply western railroads which heretofore have depended on eastern mills.

Special equipment, newly installed at Torrance for production of tie plates, includes a 12-foot high punch and shear machine equipped with a conveyor bed. Tie plate stock is semfinished on the 22 inch mill and emerges about 1-1/2 inches thick and 13 or 14 inches wide. It travels to the new equipment which punches out eight spike holes and shears the stock into 8-3/4-inch lengths.

About 87 tons of tie plates are needed for each mile of rail trackage, or about 7000 tie plates per track mile.

**New York**—Car demand continues sluggish and, in the East, little is pending, apart from the 250 to 500 fifty-ton drop-end gondolas for the Delaware, Lackawanna & Western, on which bids were closed Feb 18. The Chicago, Burlington & Quincy closed on 30 stainless steel suburban cars to the Budd Co., Philadelphia.

## Construction Spurts in Texas

**Dallas**—Despite a gradual leveling off of the overall business index in Texas, which first made itself apparent last September, building and construction awards in the Lone Star state have spurted ahead of the record pace that was set for the first six weeks of 1948.

A surge of home-building activity has pushed the volume of contract awards past the \$100 million mark, as compared with a \$91 million total for the same period last year.

For the last reported week, a total of \$16,814,000 in awards brought the aggregate for 1949 so far to \$109,874,000. Of this total, \$9,090,000 was for erection of nearly 750 one-family units. Nonresidential construction totaled nearly \$7 million. The engineering construction awards for the week were \$747,479.

## Canada . . .

**Toronto, Ont.**—Production of primary iron and steel shapes in Canada totaled 294,228 net tons in November, against 307,187 tons in October and 272,265 tons in November, 1947. November output included 284,888 tons of carbon and 9340 tons of alloy steel shapes. Production figures for November included 77,274 tons shipped to plants within the industry for further processing.

Shipments of primary iron and steel shapes for sale in November amounted to 219,363 net tons of which 209,793 tons were carbon steel and 957 tons alloy steel; October shipments amounted to 236,424 net tons of which 222,767 tons were carbon and 13,657 tons alloy steel shapes, and shipments for November, 1947 amounted to 208,402 tons in-

cluding 198,130 tons of carbon and 10,272 tons of alloy steel shapes. The above totals, which show iron and steel shapes for sale do not include deliveries for further processing.

Shipments during November included 6934 tons of semfinished shapes; 12,641 tons of structurals; 19,314 tons of plates; 29,570 tons of rails; 5160 tons of tie plates and track material; 53,841 tons of hot rolled bars; 12,945 tons of pipe and tubes; 25,635 tons of wire rods; 15,389 tons of black sheets; 8229 tons of galvanized sheets.

Of the amount shipped for sale in November, 39,823 tons went directly to railways and railway car shops; 10,637 tons to pressing, forming and stamping plants; 33,733 tons to merchant trade products; 25,827 tons to building construction; 13,069 tons to containers industry; 9894 tons to agricultural equipment; 11,834 tons to the automotive industry; 11,860 tons to machinery plants; 2701 tons to shipbuilding; 7316 tons to mining, lumbering, etc., and 2442 tons to miscellaneous industries. Wholesalers and warehousing accounted for 26,850 tons and exports, 23,377 tons.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

3500 tons, unit five, power plant extension, Boston Edison Co., East Weymouth, Mass., to American Bridge Co., Pittsburgh.

1850 tons, galvanized steel transmission towers for Bonneville Power Administration, to Isaacson Iron Works, Seattle, low \$524,683.

1840 tons, state bridge, Woodbridge, N. J., through the Franklin Construction Co., to Bethlehem Steel Co.

1700 tons, 1352-foot Clearwater river bridge, Idaho state highway project, reported to Pittsburgh-Des Moines Steel Co., Pittsburgh; general contract to Henry Hagman, Spokane, Wash., and Erickson Paving Co., Seattle, joint low bidders \$539,191.

350 tons, new school, district 3, Cheektowaga, N. Y., to the Ernst Iron Works Inc., Buffalo; John W. Cowper Co., Buffalo, general contractor.

250 tons, two steel stringer bridges, Middleboro, Mass., to Grossier & Shlager Iron Works, Somerville, Mass.; Henley-Lundgren Co., Worcester, general contractor.

200 tons, Idaho state highway bridge, to Bethlehem Pacific Coast Steel Corp., Seattle; Hanson & Parr, Spokane, general contract.

### STRUCTURAL STEEL PENDING

35,000 tons, state bridge project, Chesapeake Bay, Maryland; bids asked.

1200 tons, Mystic pier, Charlestown district, Boston.

1000 tons, housing project, Dorchester district, Boston.

650 tons, state cross Bronx expressway, Bronx county, New York, new bids asked March 9; previous proposals exceeded appropriations.

315 tons, Hungry Horse project, Bureau of Reclamation, Denver, spec. 2504, American Bridge Co., Pittsburgh, low.

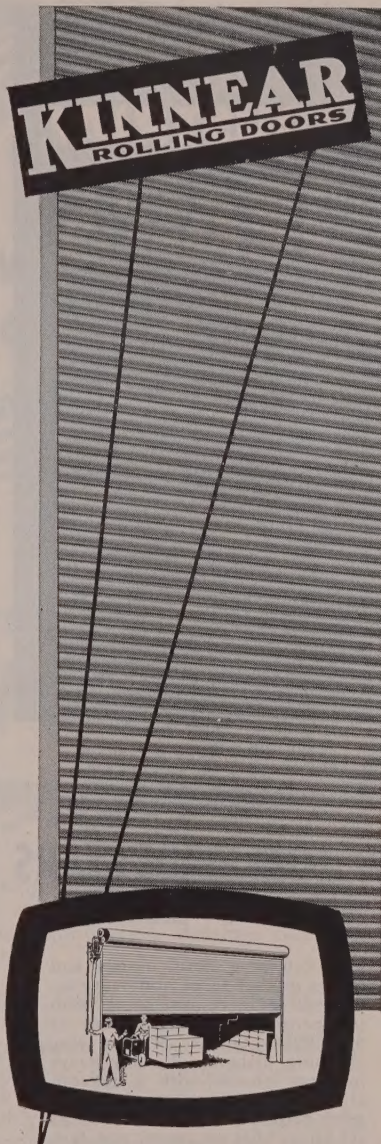
200 tons, factory building, Ehret Magnesia Mfg. Co., Valley Forge, Pa.; bids asked.

175 tons, state highway bridge, pony truss, Ayer, Mass.; bids Feb. 21, Department of Public Works, Boston.

160 tons, state highway bridge and approaches, plate girder span, Worcester, Mass.; Northern Construction Co., Lawrence, Mass., general contractor.

100 tons, also 65 tons reinforcing, relocation of 17.8 miles railroad, McNary dam project; bids to U. S. Engineer, Walla Walla, Wash., Mar. 15.

Unstated, McNary dam navigation lock, also



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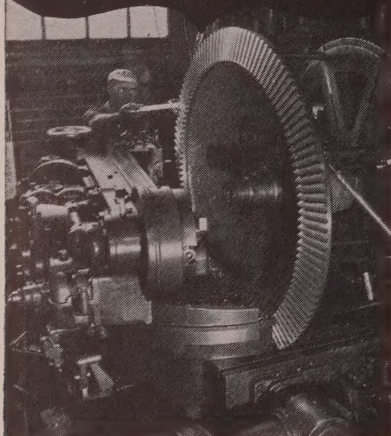
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dam fishway; bids to U. S. Engineer, Walla Walla, Wash., March 15.

Unstated, Heron street swing bridge, Aberdeen, Wash., \$375,000 project; design and specifications by General Engineering Co., Seattle; bid date not announced.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

975 tons, Eastgate Apartments, Cambridge, Mass., to Bethlehem Steel Co.; Thomas Worcester, Inc., Boston, engineer.

175 tons, new school, District 3, Cheektowaga, N. Y., to the Truscon Steel Co., Youngstown.

### REINFORCING BARS PENDING

200 tons, reinforcing bars, refinery, Louisiana; E. D. Badger & Co., Boston, general contractor.

Unstated, Seattle water department shop building, \$400,000 project; bids Mar. 9.

Unstated, juvenile home, Portland, Ore.; L. H. Hoffman, Portland, awarded general contract at \$980,142.

Unstated, two-story addition to municipal shops; bids to Tacoma, Wash., Feb. 21.

## PLATES . . .

### PLATES PLACED

3500 tons, 8500 feet of ¼-inch steel plate, Soap Lake siphon, to American Pipe & Construction Co., Portland, Ore.; Winston Bros. and Utah Construction Co., joint contractors, \$7,614,728.

Unstated, relining and repairs to Seattle Cedar river water pipe line, to American Pipe & Construction Co., low \$79,753.

Unstated, one water and two oil storage tanks for Alaska Railroad, Fairbanks, Alaska, to Chicago Bridge & Iron Co., Chicago.

### PLATES PENDING

Unstated tonnage, 100,000-gallon elevated water tank, Tracy pumping plant, Bureau of Reclamation, Antioch, Calif., Darby Steel Plate Corp., Kansas City, Jan., low, \$57,384.

Unstated, 12,750 feet 28 inch water pipe, Bremerton, Wash.; American Pipe & Construction Co., Portland, Ore., low \$93,787.

## PIPE . . .

### STEEL PIPE PLACED

Unstated, Alderwood Manor, Wash., District No. 18, water system; general contract to Malaspina & Napoli, Seattle, low \$390,371.

### STEEL PIPE PENDING

Unstated, Gilbert water district, Portland, Ore., also some cast iron service pipe; bids Feb. 24 to John W. Cunningham & Associates, Portland, engineer.

Unstated, 17,000 feet 4 and 6 inch steel pipe, King county district No. 23; Frank Bishop & Co., Seattle, low \$77,605.

Unstated, District No. 2, Bremerton, Wash.; Frank Bishop & Co., Seattle, low \$33,115 for steel, also alternates.

### CAST IRON PIPE PLACED

5000 tons, 48-inch, water line, Bridgeport, Conn., to United States Pipe & Foundry Co., Burlington, N. J.

105 tons, 6 and 8-inch, Salem, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

### CAST IRON PIPE PENDING

Unstated, 1700 feet 4 to 8 inch class 150 and accessories; bids to city clerk, Helena, Mont., Feb. 23.

## RAILS, CARS . . .

### RAILROAD CARS PLACED

Chicago, Burlington & Quincy, 30 stainless steel suburban cars, to the Budd Co., Philadelphia; cars, for delivery in 1950, will be of the two-level type.

# CONSTRUCTION AND ENTERPRISE

## CALIFORNIA

LOS ANGELES—Southern California Edison Co. will build a \$20 million hydro-electric plant on the San Joaquin river in the Sierras.

SAN FRANCISCO—Graybar Electric Co., 190 Ninth St., has awarded a \$340,000 contract to Cahill Bros., 206 Sansome St., for construction of a supply house; Felix H. Spitzer, 204 Sacramento St., engineer.

## CONNECTICUT

BRIDGEPORT, CONN.—Buckley Bros. Inc., 1 Seaview Ave., has awarded \$750,000 separate contracts for construction of an oil plant.

## IDAHO

COEUR D'ALENE, IDAHO—Atlas Tie Co., 1088 Stahorn Rd., has awarded a \$300,000 contract for erection of a plant.

## ILLINOIS

CHICAGO—Clark Water Heater, 5201 W. 65th St., has awarded a \$250,000 contract to Algot B. Larson Co., 3537 W. Lake St., for construction of a factory.

FRANKLIN PARK, ILL.—Bruner & Lay Inc., 727 S. Jefferson St., Chicago, has awarded \$250,000 separate contracts for construction of a tool manufacturing plant; W. Fred Dolke Jr., 189 W. Madison St., Chicago, architect.

LOCKPORT, ILL.—Globe Oil & Refining Co., 59 E. Van Buren St., Chicago, has awarded a \$1.5 million contract to Chicago Bridge & Iron Co., 332 S. Michigan Ave., Chicago, for construction of a plant; Universal Oil Products Co., 310 S. Michigan St., Chicago, engineer.

## OHIO

CINCINNATI, O.—Abbott Laboratories, Sheridan and 14th Sts. N., Chicago, will let a \$300,000 contract for a warehouse and office; H. N. Hermann & Associates, 701 Enquirer Bldg., engineer and architect.

CLEVELAND—Midland Steel Products Co., Madison Ave. & W. 106th St., plans to spend several million dollars in an improvement and expansion program.

CLEVELAND—Van Dorn Iron Works Co., 2685 E. 79th St., manufacturer of jail and prison equipment, has completed construction of a special railroad car designed to carry flour from mills to bakeries in bulk instead of in conventional sacks. Auxiliary equipment includes bins for receiving the flour at bakeries and ovens for baking after the flour has been mixed by machine.

LORAIN, O.—Riverlake Belt Conveyor Lines Inc. is being formed to build a two-way conveyor belt to carry coal and iron ore 130 miles across Ohio from Lorain to E. Liverpool, O. On its return trip the continuous belt will carry coal from the mines of Pennsylvania, West Virginia and southern Ohio. Cost is estimated at \$210 million; H. B. Stewart Jr., president, Akron, Canton & Youngstown Railroad, Akron, is president of the new corporation.

## OREGON

MADRAS, OREG.—Eastern Oregon Mills Inc., has awarded a \$300,000 contract to A. S. Fetterman, 3437 N. Willamette St., Portland, Ore., for construction of a plant.

## PENNSYLVANIA

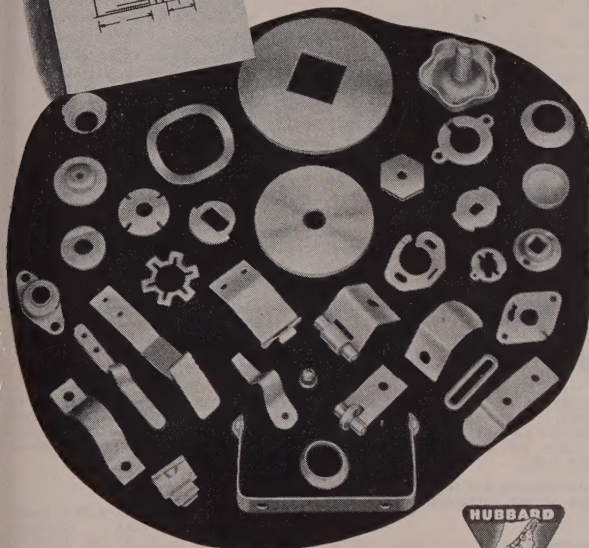
AMBRIDGE, PA. — General Motors Corp., Fisher Body Division, General Motors Bldg., Detroit, has awarded a \$2 million contract to Darin & Armstrong Co. Inc., 2041 Fenkel St., Detroit, for construction of a plant.

CREIGHTON, PA. — Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh, has awarded a \$500,000 contract to Austin Co., Union Trust Bldg., Pittsburgh, for construction of



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$$\left(2\frac{7}{16} \times 7\right) \times \left(4\frac{7}{8} \times 3\frac{5}{16}\right) =$$

$$17\frac{1}{16} \times \left(\frac{39}{8} \times \frac{53}{16}\right) = 17\frac{1}{16} \times \frac{2067}{128}$$

$$17\frac{1}{16} \times 16 \frac{19}{128} = \frac{273}{16} \times \frac{2048}{128} = 2 \times 273 = 546$$

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a bending tube building.

LANCASTER, PA.—Hamilton Watch Co. will build a \$700,000 engineering laboratory building; Prack & Prack, architect, 119 Federal St., Pittsburgh.

PITTSBURGH—Soyateed & Oil Corp., East St. Louis, Ill., has awarded a \$750,000 contract to Chemical Plants Division, Blaw-Knox Co., to design and construct a soybean extraction plant.

PITTSBURGH—Mine Safety Appliances Co., 201 N. Braddock Ave., will award a \$500,000 contract for construction of a laboratory on Penn and Braddock Aves.; Prack & Prack, 119 Federal St., architect.

WEST MIFFLIN, PA.—Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, will let a \$100,000 contract for an atomic research plant for marine power and altering buildings at Bettis Airport.

## SOUTH CAROLINA

ANDERSON, S. C.—Cranston Print Works plans to build a \$3.5 million plant.

## TEXAS

BEAUMONT, TEX.—Bethlehem Steel Corp., c/o R. F. Hoffield, purchasing agent, Island

Park, will let a \$300,000 contract for construction of a substation; Harder, Barbato & Ciampa, 90 West St., New York, engineer.

BEAUMONT, TEX.—Southern States Steel Corp., 4423 Warcola St., Dallas, will build a \$200,000 steel fabricating plant.

HOUSTON, TEX.—General Contractors has awarded a \$275,000 contract to Brown & Root Inc., P.O. Box 3, for construction of yards and shop.

JONESVILLE, TEX.—Byrd Oil Corp., Tower Petroleum Bldg., Dallas, and Ed Hurley, Atlas Bldg., Shreveport, La., will build a \$750,000 plant, own forces.

LONE STAR, TEX.—Lone Star Steel Co. has awarded a \$175,000 contract for construction of a plant; owner builds.

LONGVIEW, TEX.—Johnson Enterprises will build a \$250,000 plant unit, using its own forces.

SAN ANTONIO, TEX.—Sears, Roebuck & Co., 1409 S. Lamar St., Dallas, has awarded a \$375,000 contract to C. L. Browning Jr., Insurance Bldg., for construction of a warehouse.

## WASHINGTON

SEATTLE—Puget Sound Sheet Metal Works,

3631 E. Marginal Way, suffered \$500,000 damages from a fire. Some machinery was salvaged and removed to an adjacent building where operations were resumed. Plans for rebuilding are being made.

SPOKANE, WASH.—Seattle Steel Co. has awarded a \$200,000 contract for a branch warehouse for the Inland Empire Steel Co., a subsidiary.

## CANADA

GILMOUR, ONT.—Bouzan Gold Mines Ltd., 25 W. King St., Toronto, Ont., has contracted for a \$474,000 mine development; owner builds.

MONTREAL, QUE.—Ogilvie Flour Mills Ltd., 930 Mill St., has awarded a \$300,000 contract for construction of a power house to E. G. M. Cape & Co. Ltd., 620 Cathcart St.; Rankin & Co. Ltd., 1420 W. Sherbrooke St., engineer.

SOREL, QUE.—Titanium Corp. of Canada, 1522 W. Sherbrooke St., Montreal, Que., has awarded a \$300,000 contract to Fraser Brace Engineering Co. Ltd., 360 W. St. James St., Montreal, for construction of smelter service buildings; Surveyor & Associate, 1235 McGill College Ave., Montreal, consulting engineer.

# PRICES OF LEADING FERROALLOYS PRODUCTS

(Continued from Page 145)

## SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90c; ton lots 21.00c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices. 75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices. 90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.) Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.). C.I., lump, bulk, regular 19.0c per lb of Si, c.I. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.6c for max. 0.10% calcium grade. Deduct 0.4c for max 2% Fe grade analyzing min. 98% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 8.90c per lb of alloy, ton lots packed 10.3c, 200 to 1999 lb 10.65c, smaller lots 11.15c. Delivered. Spot up 0.5c.

## BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.00c per lb of briquet, c.I. packaged 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3 1/2 lb and containing exactly 2 lb of Mn and approx. 1/2 lb of Si). Contract, c.I. bulk 10.0c, per lb of briquet, c.I. packed 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.I. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2 1/2 lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.I. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybde-Oxide Briquets: (Containing 2 1/2 lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

## CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

## TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.). Contract, ton lots, 2" x D, \$1.40 per lb of contained Ti; less ton \$1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot \$1.28, less ton \$1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, \$160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: Ti 17-21%, C 3-4.5%). Contract, \$175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

## VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, \$2.90 per lb of contained Va. Delivered. Spot, add 10c. Crucible-Special Grades (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), \$3. Primos and High Speed Grades (Va 35-55%, Si 1.50% max., C 0.20% max.), \$3.10.

Vanadium Oxide: Contract, less carload lots, \$1.20 per lb of contained V<sub>2</sub>O<sub>5</sub>, freight allowed. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 7, 45c, freight allowed.

## TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W or more, \$2.25 per lb of contained W; 2000 lb W to 10,000 lb W, \$2.35; less than 2000 lb W, \$2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, \$2.90 per lb of contained W; less than 1000 lb W, \$3.

## ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.I., lump, bulk 6.6c per lb of alloy, c.I. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

## BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, \$1.20 per lb of alloy. Less than 100 lb \$1.30. Delivered. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), \$6.25 per lb contained B, f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb. f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

## OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 5% max., C 5% max.). Contract, ton lot, 2" x D, \$2.90 per lb of contained Cb, less ton \$2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silenz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, 1/2" x 12 M, 16.5c per lb of alloy, ton lots 17.25c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidex No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%, C 1.1c. packed, 16.50-17.00c per lb of alloy; ton lots 17.90-18.00c; less ton lots 19.40-19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.I. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of \$3 for each 1% of P above or below the base): Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; \$65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity \$1.10.

Technical Molybde-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.